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PROJECT COMPLETION REPORT

KOREA

SECOND TECHNOLOGY DEVELOPMENT PROJECT  
(LOAN 2473-KO)

JUNE 16, 1992

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Industry and Energy Operations Division  
Country Department II  
Asia Region

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### CURRENCY EQUIVALENTS

Currency Unit	-	Korean Won (W)
\$ 1	-	W 800 (at appraisal)
\$ 1	-	W 799 (at completion)
\$ 1	-	W 700 (as of June 1991)

### ABBREVIATIONS

DFC	-	Development Finance Companies
ITD	-	Industrial Technology Development
KDIC	-	Korea Development Investment Company
KIET	-	Korea Institute of Electronics Technology
KTDC	-	Korea Technology Development Corporation
KTIC	-	Korea Technology Investment Corporation
SMI	-	Small and Medium Industries
SMIPC	-	Small and Medium Industry Promotion Corporation
R&D	-	Research and Development

### FISCAL YEAR

January - December

\* Director-General  
Operations Evaluation

June 16, 1992

MEMORANDUM TO THE EXECUTIVE DIRECTORS AND THE PRESIDENT

SUBJECT: Project Completion Report on Korea  
Second Technology Development Project (Loan 2473-KO)

Attached, for information, is a copy of a report entitled "Project Completion Report on Korea - Second Technology Development (Loan 2473-KO)" prepared by the Industry and Energy Operations Division, Country Department II of the Asia Regional Office, with Part II contributed by the Borrower. No audit of this project has been made by the Operations Evaluation Department at this time.

Attachment

A handwritten signature in dark ink, appearing to be 'L. P. Mc...', is written over the word 'Attachment'.

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PROJECT COMPLETION REPORT

KOREA

SECOND TECHNOLOGY DEVELOPMENT PROJECT  
(Loan 2473-KO)

PREFACE

This report presents an evaluation of the results achieved under the Second Technology Development Project in Korea, for which Loan 2473-KO was approved on October 25, 1984. The US\$50.0 million loan was made to foster technological development of Korean industry through continued support for the Government's effort to accelerate the development of industrial technology. The loan proceeds were channelled through the Korea Technology Development Corporation (KTDC) and aimed at assisting KTDC in its institutional development, technology innovation, resource mobilization, operational expansion and support for small and medium industries (SMIs). The loan closed on June 30, 1989 with about US\$4.8 million of the loan amount undisbursed and canceled. The last disbursement was made on June 28, 1989.

The PCR was prepared by the Industry and Energy Operations Division, Country Department II, Asia Region (Preface, Evaluation Summary, Part I and portions of Part III). The PCR draws on the Staff Appraisal Reports for the Second and the subsequent (approved in 1988) Third Technology Development Projects (Loan 2913-KO); the Loan and Guarantee Agreements; supervision reports, correspondence between the Bank and KTDC; internal Bank memoranda; KTDC's financial reports and project data provided by KTDC. It presents a review of the implementation of the project, the extent to which institutional objectives were achieved and the results of the investment made. KTDC have been very helpful in providing useful data for Part III and submitted their respective Part II as contribution to the PCR in a timely manner.

PROJECT COMPLETION REPORT

KOREA

SECOND TECHNOLOGY DEVELOPMENT PROJECT

(Loan 2473-KO)

EVALUATION SUMMARY

1. The overall objective of the loan of \$50.0 million was to foster the technological development of Korean industry through continued support for the Government's effort to accelerate the development of industrial technology. The specific objectives of the project were to: (a) assist KTDC's institutional development; (b) assist KTDC's catalytic role in technology innovation; (c) help establish a resource base for KTDC; (d) expand KTDC's operations involving risk-sharing financial instruments; and (e) expand KTDC's support to SMIs. The project consisted of two components: (a) a line of credit of \$49.7 million to cover KTDC's foreign exchange requirements during 1984-86; and (b) a technical assistance fund of \$300,000 for KTDC institutional development (paras. 3.1-3.2). The loan followed a previous successful loan to KTDC (Loan 2112-KO; First Technology Development Project; 1982) for which a PPAR was issued on June 13, 1989 (PPAR No. 7906).

2. Overall the project components were successfully executed. KTDC committed and disbursed about \$45.2 million three months later than the originally estimated schedule at appraisal and the loan closed in 1989 in accordance with original appraisal estimate. Commitments under the loan, however, were slower than the first loan largely because of the high premium on Bank funds (resulting from the appreciation of the currencies which dominate the Bank's pool of currencies) and the availability of foreign exchange from commercial sources at comparable interest rates without foreign exchange risk (para. 5.1).

3. Under the Bank loan KTDC approved 89 subprojects amounting to W26 billion of which 50% was financed by KTDC. Funds allocated for institutional development was reallocated to the line of credit because KTDC opted to utilize cost-free UNDP funds and other subsidized sources of financing (paras. 5.2-5.3).

4. Overall the project has been successful and achieved most of its objectives. KTDC's staff capabilities and skills in technology financing were strengthened significantly. KTDC staff participated in overseas training covering areas such as managing technology innovation, financing R&D, venture capital operations and small business management during 1984-87. Several KTDC staff participated in UNDP-financed overseas training. Some of KTDC's staff also participated in a UNDP sponsored seminar in project appraisal techniques in Korea. KTDC established close links with related local and foreign institutions and concluded bilateral cooperation agreements with them (paras 6.1-6.2).

5. KTDC supported projects at all stages of technology development from R&D start-up to first commercialization. Of its total financing through 1989, about 82% went to in-house R&D activities including process

improvement activities; 7% to technology imports; 9% to commercialization; and 2% to the purchase of research equipment. KTDC has also pre-evaluated 372 proposals under the "Industrial Technology Support Program" of which 44 have been actually financed by KTDC (paras. 6.3-6.4).

6. During the project period (1984-87), KTDC mobilized resources amounting to W170 billion which compared favorably with the W167 billion estimated at appraisal. Of this amount, 67% was sourced domestically, albeit largely through the direct and indirect assistance by the Government: through borrowed funds under the Government's special loan program, through equity, and through indirect support by way of Government guarantees of the Bank loan and domestic debentures and by way of tax incentives to privately-funded KTDC equity (para. 6.5).

7. KTDC's objective of expanding operations involving risk-sharing instruments fell slightly below expectations but continued to improve with an encouraging trend. Only 75% of the projected amount at appraisal was realized. However, the share of risk-instruments to total instruments continue to increase from 4% in 1983 to 14% in 1986 (para. 6.9).

8. KTDC exceeded original expectations of providing expanded support to SMIs. KTDC's support of SMIs increased from 29% in 1983 to 76% in 1986 in terms of total financing. However, while SMIs account for 85% of total local currency funding in 1986 (due in part to the requirement for utilization of government-funds), SMIs utilization of foreign currency funds continue to be low. Factors which contributed to this low level of utilization were the reluctance of SMI sub-borrowers to assume the foreign exchange risk; and the Bank's reporting and approval requirements which the SMI sub-borrowers considered to be too cumbersome (para. 6.10).

9. KTDC continued to show satisfactory financial performance during the period 1984-89, attributed to a significant increase in its lending portfolio, rapid growth in investment income and government interest rate subsidies until 1988. However, Government subsidies dropped from a high of 20% of total income in 1984 to 4% in 1986 and were eliminated completely in 1989. These reductions reduced KTDC's margins well below the covenanted spread of 2.5%. The quality of KTDC's conventional loan portfolio continued to be sound throughout the project (paras. 8.1-8.3).

10. Despite the excellent performance to-date, KTDC's future prospects are still evolving and not exactly clear. Although it is now a well established financial institution staffed with qualified professionals, KTDC needs to adjust itself to a liberalized financial sector environment. KTDC's future plan would be followed up in the context of the supervision of the follow-on Third KTDC loan approved in 1988 (paras. 9.1-9.3).

11. KTDC has maintained a sound financial position reflecting partially, the quality of credit appraisal of its specialized staff. While most of its investments are not start-up ventures in the true sense of the word, KTDC has certainly pioneered a new business and help develop an environment and a pool of professionals for later capital venture companies. An independent study of KTDC's effectiveness indicate that KTDC has had a



positive impact for technology development in KTDC-financed companies through its role as technology broker and financier (para 10.1).

12. Several important lessons emerged from the implementation of the project: (a) making the financing of industrial technology development successful requires a favorable policy framework; (b) the significant private sector participation in KTDC and the corresponding management style have contributed to its success; and (c) financing technology ventures by foreign exchange loans, particularly for SMIs, increases the credit risk during significant foreign exchange fluctuation (para. 10.2).

# PROJECT COMPLETION REPORT

## KOREA

### SECOND TECHNOLOGY DEVELOPMENT PROJECT (LOAN 2473-KC)

#### PART I: PROJECT REVIEW FROM BANK'S PERSPECTIVE

##### 1. Project Identity

Name	:	Second Technology Development Project
Loan Number	:	2473-KO
RVP Unit	:	Asia Region
Country	:	Republic of Korea
Sector	:	Industry
Subsector	:	Technology Finance

##### 2. Project Background

2.1 Korea's industrial development can be described as one of transition from import substitution to export promotion through policies which have stimulated high labor productivity and international competitiveness. Since the early 1970s, the Government has furthered industrial technological development to support industrial development. Research institutes, industrial standards, testing and educational facilities for technicians and scientists were set up, providing a solid infrastructure for industry to move to the next stage of development. At the same time, the Government has provided a policy framework which stimulated both domestic industrial research and development as well as technological transfer from abroad.

2.2 The Bank's direct involvement in assisting the Government's effort to foster industrial technological development was initiated in 1979 with Bank financing for the Electronics Technology Project (Loan 1676-KO). The project sought to develop the capacity of the Korea Institute of Electronics Technology (KIET) to support the local electronics industry by providing specialized services, manpower training, acquisition of foreign technology and by undertaking, jointly with industry the feasibility of establishing a Korean-run, advanced semiconductor processing facility. The Bank also supported the newly founded Korea Technology Development Corporation (KTDC) with three loans totalling US\$150 million between 1982-88 (Loans 2112-KO, 2473-KO and 2913-KO). The Bank assisted the Small and Medium Industry Promotion Corporation (SMIPC) (Loans 2215-KO and 2515-KO), which complements the activities of KTDC by providing support to small- and medium-scale (SMI) industries for expansion of facilities. In May 1983, IFC invested W750 million in the newly created Korea Development Investment Company (KDIC), a venture capital company whose primary objectives include the provision of equity finance for commercialization of new technology. The Bank has also extended education sector loans (Loans 1800-KO, 2427-KO and 3037-KO) to improve the quality of higher education in science and engineering, and to increase the supply of qualified Korean engineers, technicians and managers.

### 3. Project Objectives and Description

3.1 The overall objective of the project was to foster the technological development of Korean industry through continued support for the Government's effort to accelerate the development of industrial technology. Specifically, the project aimed at: (a) assisting KTDC's institutional development through technical assistance, staff development and training; (b) assisting KTDC's catalytic role in technology innovation; (c) helping to establish a resource base for KTDC that would be sustainable over the long-term; (d) expanding KTDC's operations involving risk-sharing financial instruments such as conditional loans and equity investments; and (e) expanding KTDC's support to S.M.I.s. The loan followed a previous successful loan to KTDC (Loan 2112-KO; First Technology Development Project; 1982) for which a PPAR was issued on June 13, 1989 (PPAR No. 7906).

3.2 The project consisted of two components: (a) credit line of \$49.7 million to cover the estimated foreign exchange requirements of subprojects financed by KTDC during 1984-86; and (b) \$300,000 for technical assistance to support KTDC's institutional development programs. The TA component included: (i) consulting services to support the operations of KTDC and training of its staff, both to further deepen KTDC's capacity to identify, appraise, and supervise research and development (R&D) projects and to enable KTDC to carry out surveys of the technological needs of Korean industries; and (ii) purchase of training materials for KTDC staff.

### 4. Project Institution

4.1 KTDC was established under the KTDC Act promulgated on December 31, 1980, and the associated Enforcement Decree issued on April 22, 1981. It was created with strong support from the Government and the private industry. The Bank played an active role in KTDC's conception, and in designing its ownership, organizational structure, and operational policies and procedures. KTDC's principal goals are to promote the development of industrial technology and to facilitate desirable changes in industrial structure, so as to strengthen the international competitiveness of Korean industry.

4.4 In November 1986, KTDC established its own venture capital subsidiary under the auspices of the "Small and Medium Sized Industries Inauguration Promotion Act". The subsidiary, Korea Technology Investment Corporation (KTIC) makes equity investments, convertible bonds and bonds with warrants in its financing of new, small, high-growth potential companies, principally at their start-up stage. KTIC started with a paid-in capital of W20 billion from the Small and Medium Industry Promotion Corporation (SMIPC) in 1986; at the end of 1987, KTIC's paid-in capital stood at W8.6 billion of which 43% is KTDC's share of the equity. KTIC invested W2.2 billion in 22 start-up companies with the cooperation of KTDC in 1987.

## 5. Project Implementation

5.1 Overall, the project components were successfully executed. KTDC's utilization of the loan has been satisfactory; although loan disbursements have fallen short of appraisal estimates necessitating a revision of the disbursement schedule. The loan was committed and disbursed three months later than the estimated schedule at appraisal. About US\$ 4.8 million of the undisbursed amount was canceled on the scheduled closing date. Commitments under the loan were considerably slower than the first loan largely because of the high cost of Bank funds resulting from the appreciation of the currencies which dominate the pool of currencies for which sub-borrowers were liable. Another factor causing the slow pace of commitments was the relatively easy availability of credits in Won for borrowing in foreign currencies at competitive interest rates, without foreign exchange risk. On its part, KTDC can be commended for making great efforts, under the circumstances, to on-lend Bank funds and to explain to sub-borrowers the operation and risks of the Bank's currency pooling system. The estimated, revised and actual disbursements during implementation of the project are given in Part III, Annex 3.

5.2 Under the loan, KTDC approved 89 subprojects amounting to WB23.7 billion. Total subproject cost amounted to W55.8 billion (about US\$67 million), of which 42% was financed by KTDC. The approved subprojects were about equally distributed among the major industrial subsectors in which KTDC concentrates its lending: machinery and metals (29%); electrical and electronic goods (29%); and chemical and other products (42%). All subloans under the Bank loan went for conventional lending and most went to large sized companies. About 70% of the subloan amount were above the free limit of US\$ 300,000, requiring Bank-approval. There were 27 subloans above the free limit and 62 below the free limit. A detailed distribution of subprojects is given in Part III, Annexes 4.1-4.3.

5.3 Under the first project, US\$650,000 was earmarked for staff development and training. Similarly in the second project, US\$300,000 was allocated for such a purpose. However, KTDC opted to utilize grant funds from UNDP and other concessionary sources. Therefore, funds allocated for institutional development was reallocated to the line of credit.

## 6. Project Performance

6.1 Institutional Development. KTDC's organization has changed periodically to meet the needs of the rapidly changing industrial and venture capital environment. It is a well-managed company and employs well-qualified staff. Presently, KTDC has 65 professional staff, which include 22 engineers, seven lawyers, and 32 financial analysts or economists. This is in line with the appraisal expectations. Continued staff development is important for KTDC in its role of financing technology development. Twenty-five staff participated in overseas training covering areas such as managing technological innovation, financing R&D, venture capital operations and small business management during 1984-89. Fifteen KTDC staff participated in the UNDP-financed overseas training of a Bank-executed program called "KTDC Institutional Development Project" while 19 staff also received the UNDP/Bank-sponsored Project Appraisal Techniques seminar in Korea. There were other domestic

external and on-the-job training provided during the period and presented in detail in Part III, Annex 4.4 of the report.

6.2 KTDC has also established close relationships with local and foreign financial institutions for training and information exchange. In 1987 it concluded a bilateral cooperation agreement with three local and five foreign institutions including Japan Associated Finance. Through this network, KTDC participated in international seminars in Paris and London to share experiences and establish cooperation ties for technology transfer.

6.3 Technology Innovation. KTDC supported projects at all stages of technology development from R&D start-up to first commercialization. The projects financed various activities such as idea generation, feasibility studies, technical R&D, development of prototypes and pilot plants, preliminary production and test marketing. Of its total financing through 1989 about 82% went to in-house R&D activities (including process improvement); 7% to technology imports; 9% to commercialization; and 2% to the purchase of research equipment. Of the Bank-financed 89 projects under the loan amounting to US\$45 million, 49% of the total amount (US\$22 million, 49 in number) was for R&D; 31% (US\$13.8 million, 18 in number) was for technology import; 8% (US\$3.7 million, 8 in number) was for the purchase of R&D equipment; 7% (US\$3 million, 7 in number) was for the improvement of the manufacturing process; and 6% (US\$2.6 million, 7 in number) was for the commercialization of new products.

6.4 KTDC has been empowered by the Ministry of Science and Technology to undertake technology pre-evaluation for the "Industrial Technology Development Support Program" which is partially funded by the Government in its efforts to promote cooperative research between public research institutions and industrial firms. During the project period, KTDC, in close consultation with the Technology Review and Advisory Committee, pre-evaluated 372 proposals of which 44 have been financed by KTDC amounting to W14 billion (See Part III, Annex 4.5 for details).

6.5 Resource Mobilization. During the project period, 1984-87, KTDC mobilized resources amounting to W170 billion, compared with W167 billion estimated at appraisal. Of this amount, 65% was sourced domestically amounting to W111 billion. This effort was accomplished largely through the direct and indirect assistance by the Government. Of the W170 billion mobilized during the period, the Government has provided 6% (W10 billion) in equity and 22% (W37 billion) in government loans to KTDC from the government's special loan program with favorable terms and conditions. The Government also provided indirect support by: (a) guaranteeing the Bank-financed loan which contributed 35% (W59 billion) of total resources and domestic debentures<sup>1/</sup> which contributed 30% (W51 billion); and (b) providing tax incentives to private-funded KTDC equity, which contributed 8% (W13 billion) to total resources mobilized for the period. Foreign currency resources mobilized amounted to W59 billion sourced solely from the Bank-financed loan (See Part III, Annex 5.3).

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1/ During 1983-88, KTDC issued ten series of debentures with various discounts with the payment of principal plus interest guaranteed by the Government except for the tenth debenture.

6.6 Since January 1987, four established venture capital companies including KTDC have obtained the sanctions of operating venture investment partnerships, leasing and factoring operations under the auspices of the New Technology Business Financial Support Act. Investment partnership was a newly introduced venture financing scheme in the country in 1987 for facilitating the inflow of domestic speculative capital and for providing sources of venture capital. The investment partners solicit venture capital funds from limited investors including institutional investors such as pension funds and financial institutions. KTDC acts as general partner responsible for managing the fund portfolio. KTDC created three partnership funds: KTDC1 amounting to W2 billion in 1987; KTDC2, W3.5 billion in 1988; and KTDC3, W5 billion in 1989.

6.7 Expansion of KTDC's Operations. Of the total projected amount of W264 billion for financial instruments for the period, KTDC approved a total amount of W250 billion. Of this amount, Conventional Loans totalled W226 billion (vs. estimate of W232 billion); Conditional Loans, W5 billion (vs. estimate of W7 billion); convertible Bonds, W9 billion (no estimated figures); and Equity Shares, W9 billion (vs. estimate of W26 billion). The share of local currency loans (Conventional Loans, W160 billion and Conditional Loans, W6 billion) continue to dominate KTDC operation at W166 billion having been approved for the period. Foreign currency loans, which are solely Conventional Loans, amounted to W68 billion.

6.9 A major goal of KTDC, and supported under the project is to expand KTDC operations involving risk-sharing instruments, such as conditional loans and equity investments, including convertible bonds. During the project period, KTDC's actual performance in this category of instruments fell slightly below expectations but continued to improve with an encouraging trend. While at appraisal risk-sharing instruments were expected to amount to W32 billion (on approval basis), the actual results were W24 billion, representing 75% of the projected amount. The encouraging note is the noticeable trend towards expanded risk-sharing operations. The share of conditional loans and equity investments (convertible bonds and equity shares) increased from 4% in 1983 to a high of 14% in 1986. The trend continued as the proportion of expanded risk-sharing operations reached a level of 18% in 1989. The detailed performance of these operations are provided in Part III, Annexes 5.1-5.2.

6.10 Expanded Support of SMIs. KTDC exceeded expectations of providing expanded support to SMIs through timely promotional activities, technical/managerial advice and increased financing of SMI R&D projects. An indication of these efforts were the gradual shift from the past dominance of larger corporations in the KTDC portfolio to small- to medium scale corporations. KTDC's support of SMIs increased from 29% in 1983 to 76% in 1986 in terms of total amount of financing. The results are even more pronounced in terms of number of companies: 174 out of 198 projects financed in 1986 were SMIs. KTDC's total financial commitment up to December 31, 1986 is equally shared between SMIs and large corporations. However, while SMIs account for 85% of total local currency funding in 1986 (due in part to the requirement for utilization of government-sourced funds), SMI's utilization of foreign currency funds, including Bank-funds continued to be low. Of the 89 subprojects financed by the loan, only 47% went to SMIs amounting to W18 billion or 40% of total loan amount. The low utilization of Bank loan funds by SMIs is in part a reflection of low

import content of their projects. But there were two additional contributing factors: the reluctance of SMI sub-borrowers to assume the foreign exchange risk; and the Bank's reporting and approval requirements which the SMI sub-borrowers considered to be too cumbersome. These constraints have been addressed in the succeeding third project.

6.11 Under the government's program of promoting promising SMI's, KTDC sought to reinforce the competitiveness of technology development among SMIs by making continuous efforts of selecting and supporting technology intensive SMIs. Forty companies have been selected as most promising by KTDC during the project period.

## 7. Bank Performance

7.1 Following the successful implementation of the first loan to KTDC, this operation represented the second phase of the Bank's continued support of the government's efforts to accelerate the development of industrial technology. Bank involvement in the preparation and supervision of the project has contributed not only to strengthening KTDC's institutional development, but also to periodic discussions with Government of its R&D policies especially with regard to establishing closer links between industry and public research institutes and its support and promotion of the industry's R&D capability.

7.2 Supervision effort on the project was generally adequate. The preparation and appraisal missions for the Third Technology Development Project were de-facto supervision missions for this project.

## 8. Borrower Performance

8.1 KTDC's financial performance continued to improve significantly during the period 1984-89. The net income before tax increased from W38 million in 1984 to W6.5 billion in 1989. As a result, KTDC's financial position continued to be satisfactory with a debt equity ratio of 3.9 in 1989. KTDC's good financial performance can be attributed to: (a) a significant increase in its lending portfolio, averaging annually at 20% from 1984-89; (b) a rapid growth of its income from equity investments (which yielded an annual average growth of 69%); and (c) government interest rate subsidies of about W10.8 billion from 1984-88. In 1984 the share of interest rate subsidies to total income was as much as 20%; by 1988, it dropped to 4% and was non-existent in 1989. A more detailed presentation of KTDC's financial operations and condition from 1984-89 can be found in Part III, Annexes 5.4-5.8.

8.2 The importance of government subsidies/interest rate support to KTDC finances cannot be overlooked because without this subsidy for the first and second Bank loan and for its debentures in 1985 and 1986, KTDC would have recorded net losses of W1.8 billion in 1984, W1.7 billion in 1985 and W0.4 billion in 1986.

8.3 Without government support in the future, KTDC's ability to mobilize resources at competitive terms while maintaining a sound financial situation is unclear. In 1986, the Government reduced the interest rate subsidies to KTDC for the first Bank loan and KTDC debentures, reducing KTDC's margins well below the covenanted minimum

spread of 2.5% (Section 2.10 (c) and (d) of the Loan Agreement). The total spread on average total conventional loans was 2.20% in 1985; 0.96% in 1986; 1.23% in 1987; 1.83% in 1988 and 2.21% in 1989. (See Part III, Annex 5.4 for details.)

8.4 KTDC's conventional loan portfolio remains sound with a very low level of non-performing assets (less than 2%). Most of the conditional loans are also of good quality. However, the quality of equity investments is mixed. As of December 31, 1989 KTDC's total equity investments amounted to W21.1 billion of which investments in 12 companies amounting to W2.9 billion were non-performing. KTDC did not make any provisions against these investments in 1989 since Korean regulations provide for such exemptions. However, the impact of these non-performing assets on KTDC's overall financial condition is fairly limited.

## 9. Project Sustainability

9.1 KTDC is now a well established financial institution staffed with qualified professionals. The demand for their service is growing as Korean industry develops rapidly. More and more would-be entrepreneurs are aspiring to begin their own business, and more and more enterprises have become more technologically oriented to cope with increasing competition in the local and international markets. Their ardent desire to succeed in technology venture is the most important factor to ensure sustained performance of technology financing institutions like KTDC. However, KTDC needs to adjust itself to a liberalized financial sector environment.

9.2 The main challenges facing KTDC for the 1990s are two-fold: first, it needs to develop a sustainable strategy for resource mobilization with government support, and second, it must compete with other institutions in a progressively liberalized financial sector environment. On both points, KTDC's future prospects are not yet clear. The elimination of government's financial support means that KTDC needs to offer a broader range of financial products and fee-based services. This will require a modification of KTDC's Act which constrains it from diversifying its services.

9.3 The Government had intended to fully privatize KTDC by divesting its 22% shareholdings (the remaining 78% is held by private companies, Asian Development Bank and Deutsche Entwicklungsländern GmbH) by 1990. However, so far diversification efforts have been unsuccessful because of stock market conditions. Furthermore, in order for KTDC to qualify for stock market listing, it will need to show at least a 15% return on equity in the year of the listing. This will require a sharp rebound in KTDC's future profitability through a product diversification strategy. Whether KTDC can manage to continue to have a niche in technology financing and in being an active promoter of R&D and technology adaption while facing pressures to increase its project remains to be seen.

## 10. Conclusions

10.1 The project was clearly successful in achieving most of its objectives. First, KTDC has maintained a good quality portfolio with only 2% of its assets considered non-performing. This reflects, at least



partially, the quality of credit appraisal of specialized staff for technology oriented ventures and companies. Second, although most investments are not true start-up ventures, KTDC certainly pioneered a new business and helped develop the environment and a pool of professionals for later venture capital companies. Third, a study by KAIST indicated positive impact for technology development in KTDC-financed companies through its role as technology broker and financier. Today, KTDC is considered a model for technology financing institutions which many developing countries are trying to establish.

10.2 Several important lessons emerged from the implementation of this project:

- (a) Making the financing of ITD successful requires a favorable policy framework. During the project preparation and implementation period, the Government undertook important policy measures which helped in developing ITD projects. These included: (i) encouragement of R&D by industrial firms with strong incentives; (ii) liberalization of foreign technology imports; and (iii) encouragement of closer linkage between industry and non-profit R&D institutions.
- (b) The ownership structure and management responsibility of KTDC have contributed to its success. KTDC has strong private sector participation, which ensures its close ties to the industry. Although the Government is the largest shareholder, KTDC's day-to-day operation has been fully delegated to its management without bureaucratic interventions. This is the key which enables KTDC to respond quickly to its customers's changing needs.
- (c) Financing technology ventures by foreign exchange loans, particularly for SMIs, increases the credit risk at a time of significant foreign exchange fluctuation. This experience of KTDC's SMI clients was reported to be the major deterrent to greater use of the Bank loan.

PROJECT COMPLETION REPORT

KOREA

SECOND TECHNOLOGY DEVELOPMENT PROJECT  
(LOAN 2473-KO)

PART II: PROJECT REVIEW FROM BORROWER'S PERSPECTIVE

## I. KTDC'S ROLE AND LOAN OBJECTIVES

### 1. KTDC'S ROLE

1.1 The principal role of KTDC is to promote and accelerate the technological development of Korean industries and to foster local entrepreneurship among industries in Korea.

1.2 To fulfill this role, KTDC performs its functions through the following instruments :

(a) Long-term R&D Financing : up to 10 years repayment period including a 3-year grace period.

(b) Venture Capital (or risk-sharing) Financing : KTDC uses venture capital financing as a means of technology financing. This includes equity investment, conditional lending, convertible bonds and bonds with warrants.

(c) Brokerage Services : KTDC's extensive networking with local industries, financial institutions, overseas companies and international organizations enables it to provide brokerage services in matchmaking researchers and entrepreneurs both in Korea and abroad.

(d) Investment Partnership Management : This is a venture capital financing program to make investment in new or existing small and medium sized industrial companies in the form of equity investments, convertible bonds or bonds with warrants.

(e) Leasing and Factoring : These financing operations were recently added for flexible financing and add-on financing to the SMI clients of KTDC.

(f) Information Services : Because of its intimate knowledge of the status of technology development and the needs of the industries, KTDC has been commissioned by the Government to evaluate projects applied to "Industry-led National Research and Development Project Program". The Program is designed to stimulate private sector's industrial research works by providing government financial support in part. KTDC recommends to the Government the prioritization of the applications.

## 2. LOAN OBJECTIVES

1.3 The main objective of the loan was to give support of the Government's effort to facilitate the structural transformation of Korean industry through acceleration of industrial technology development. Specifically, the project was to : (a) assist KTDC's institutional development through technical assistance, staff development, and training ; (b) assist KTDC's catalytic role in technology innovation ; (c) establish the foundation for a long-term resource base for KTDC ; (d) expand KTDC's operations involving risk-sharing financial instruments : and (e) expand KTDC's support to SMI.

1.4 The Loan Consisted of :

Part A : A line of credit to help cover costs of industry-sponsored R&D subprojects.

Part B : Institutional development of KTDC, comprising (i) consulting services to support the operations of KTDC and training of KTDC staff, both to further deepen their capacity to identify, appraise, and supervise R&D projects and to enable KTDC to carry out surveys of the technological needs of Korean industries ; and (ii) purchase of training materials for KTDC staff.

## II. KTDC PERFORMANCE

### 1. INSTITUTIONAL PERFORMANCE

#### Legal Framework and Ownership

2.1 KTDC was established under the KTDC Act promulgated on December 31, 1980, and the associated Enforcement Decree issued on April 22, 1981. This special KTDC Act and the associated Presidential Decree enable KTDC to :

- (a) operate in an autonomous manner with the efficiency of a private company,
- (b) to have a strong and independent management, and
- (c) to have the ability and means to attract and retain staff of high caliber and entrepreneurship. All these factors are most critical to the success of an operation of KTDC. Public interest in KTDC, by way of Government financial support, such as equity contributions, loans, loan guarantees, etc. is safeguarded principally through Government representation on KTDC's Board of Directors, exercising the usual rights of a shareholder. To prevent KTDC from being dominated by any one private shareholder, the KTDC Act stipulates that the ownership of any shareholder, with the exception of the Government and international development financing institutions, be limited to no more than 7% of the total shares issued, and that in case any such shareholder's shares should exceed 7% of the total shares issued, his voting rights would be limited to 7%.

2.2 The ownership of KTDC has undergone gradual changes in the course of the last 9 years. With the acceptance of Asian Development Bank in 1988 and German Finance Company for Investments in Developing Countries in 1989 (DEG) as a

shareholder and the transfer of a sizable portion of the governments' share to Korea Development Bank in 1987, the ownership structure of KTDC at the end of 1989 stood as shown in Annex 14.

2.3 The government has announced its intention to sell its 15.1% interest in KTDC in 1990, the remaining 7% by 1992 to KTDC's existing shareholders who don't exceed 7% of the total shares issued.

#### Operating Policies

2.4 KTDC's Operating Manual provides broad guidelines for its operations, including the scope of loan and investment activities, criteria for investment decisions, diversification of assets, promotion of SMI, relations with clients, and generation of profits. Combined with other operational policies (such as limiting KTDC's equity investments in any single enterprise to not more than 10% of its paid-in capital and reserves), there are adequate safeguards to protect KTDC from an undue concentration of its assets.

2.5 Details of the terms and conditions of KTDC's loan and equity investment and procedures are given in the Statement of Investment and Operational Policies. KTDC has promoted and financed the following types of projects under the second Bank loan :

- (a) Loans for in-house R&D costs and/or for the cost of contracts for technological development with external research organizations ;

- (b) Investments and loans for initial efforts for the commercialization of the results of R&D ;
- (c) Loans for technology import or for the adaptation and improvement of imported technology ;
- (d) Loans for engineering costs associated with the construction of industrial facilities ;
- (e) Technical advisory services to industrial enterprises with respect to the business activities referred to in (a) through (b) above and/or technical feasibility surveys for other R&D facilities ; and
- (f) Use of foreign specialists and technical advisers, and training of R&D personnel.

#### Project Supervision

2.6 KTDC has established supervision systems and procedures which are more efficient and effective than those established during the implementation of the first Bank Loan. Projects encountering financial or operational difficulties are closely monitored by the responsible department. The systems with which ongoing projects are classified by the degree of need for supervision have been developed and being implemented in order to improve performance in this regard.



Korea Technology Investment Corporation (KTIC)

2.7 KTIC was established in November 1986 as a subsidiary of KTDC to operate in accordance with the Small and Medium Enterprise Inauguration Assistance Act. As stipulated by the Act, KTIC specializes in financing newly established SMI through equity investments and partnership venture fund operations.

KTDC benefited from KTIC through ; (i) offering subsequent financing in various forms to the SMI clients of KTIC, and (ii) accumulating know-how on venture capital operations (equity investments and partnership venture fund).

Organization, Management and Staff

2.8 The responsibility for the policy and general direction of KTDC's business rests with the Board of Directors headed by a Chairman, who is the Chief Executive Officer of one of the large industry groups. The President, who reports directly to the Board, is responsible for KTDC's overall operations. The Board has fully delegated authority to approve individual loans and investments to the Executive Directors' Committee consisting of all directors that are managers of KTDC. Such delegation enables KTDC to respond quickly to private industry's changing R&D needs.

2.9 KTDC's organization has changed periodically to meet the needs of the rapidly changing industrial and venture capital environment. KTDC now has eight departments aside from three Branches in Pusan, Kwang-Ju, Tae-Gu and one representative office in U.S.A. In 1990, another domestic branch will be established in Tae-Cheon to provide support to promising entrepreneurs. The

three Project Finance Departments, which are divided by major industrial sectors (machinery and metal, electric and electronics, and chemical and others), are responsible for project identification and appraisal and supervision. The Project Promotion Department is responsible for planning and coordination relevant to appraisal, supervision and investment partnership management. The Fund Management Department is responsible for fund raising and investment of liquidity assets ; and the Planning and Administration Department is responsible for planning, budgeting, personnel and other support services. The International Business Development Department is responsible for brokerage service and other international business. The Leasing Department is responsible for leasing business.

2.10 At present, KTDC has 65 professional staff of which 22 are engineers, 7 lawyers, and 32 financial analysts or economists.

#### Staff Development and Training

2.11 As a result of KTDC's major role in financing as technology development, staff development has special significance. Despite its recruitment of qualified staff with some experience, the absence in Korea of persons with experience in technology financing or venture capital caused KTDC immediately to develop an extensive program of domestic and overseas training along with regular staff reassignment, generally after three years.

2.12 From 1984-1989, 25 professionals participated in overseas training (for two weeks to one year). The programs have covered such areas as managing technological innovation, financing R&D, venture capital operations and small

business management. From 1984 to 1987, under a UNDP-financed and Bank-executed "KTDC Institutional Development Project", fifteen staff received overseas training. The UNDP project also funded the training of week-long project appraisal techniques seminar in Korea for 19 staff. KTDC's domestic training mainly consists of : (a) Master of Business Administration programs at graduate schools ; (b) on-the-job training in KTDC and KTDC's portfolio companies ; (c) courses at a training center for bankers in Korea ; and (d) two or three-day in-house training as well as language training.

## 2. OPERATING PERFORMANCE

### Overall Operations

2.13 KTDC approved 1,304 projects between 1984 and 1989, providing seed money which had a substantial multipliers effect on industries' investments in R&D. Total approval amounted to ₩391.1 billion during the period.

2.14 KTDC supports projects at all stages of the technology development process from R&D start-up to commercialization stage, 82% going to in-house research activities, 7% to technology imports, 9% to commercialization, and 2% to purchase of research equipment. The distribution among industries had been made fairly even with the proportion of 37% for machinery/metal sector, 30% for electronics/electrical sector, 33% for chemical/others sector.

### Financial Support to SMI

2.15 KTDC supports all industries including large-scale enterprises, but special emphasis is placed on small and medium-sized industrial companies. The task of KTDC's preferential treatment to SMI was difficult to accomplish during the initial period of its business operations, given the conditions of technological development capability and early awareness of technology of the large-scale enterprises in the industrial sector. Most of the SMI had limited in-house technological capability for developing R&D projects, limited international exposure to identify sources of technologies or ideas for products/processes, and financial constraints. KTDC's support to SMI increased from less than 30% in 1981/82 to over 95% in 1989 in terms of total amount of financing. The results are even more highlighted in terms of the number of projects ; 273 out of 278 projects financed in 1989 were SMI's projects.

### Venture Capital Financing Instruments

2.16 KTDC employs various types of financial instruments which is one of the factor that differentiates KTDC from other financial institutions. KTDC's commitment by category of risk-sharing financial instruments including equity investments, convertible bonds, conditional loans amounts to ₩44.0 billion, or 11.3% of total approval during the period 1984-1989.

The number of investment portfolio companies in this category is 125 firms as of now. Of the investee companies, 9 companies were brought to the public stock market giving KTDC hefty returns on its venture capital investment and about 10 companies will be taken to public offering in 1990.

Relationship between KTDC and its clients

2.17 KTDC maintains a very close and cooperative relationship with its clients. KTDC typically receives preliminary inquiries from entrepreneurs, researchers, and inventors with project ideas. A project idea at that stage is, sometimes, neither well-conceived nor sufficiently developed to constitute a bankable project. Through interviews with potential applicants, KTDC staff also provide advice and suggestions based on their own expertise. Once a formal application is received, the technically-trained and business-trained project appraisal officers work together in evaluating the applications. In case that the project sponsor is in critical need of KTDC's managerial support, KTDC helps the investee company by dispatching its staff to the company for a certain period of time upon the investee company's request. A notable feature of KTDC's assistance to its portfolio companies is that KTDC's wide network of industry information and professional financial and managerial expertise may be taken advantage of. Based on its expertise and wide network, KTDC provides a comprehensive support for the growth of its portfolio companies, which encompasses managerial and financial consultation, even including the groundwork for going public.

2.18 As the number of KTDC's client companies reached approximately 470 industrial companies, KTDC has been able to act as an intermediary among them. Activities include complementary sourcing of components and parts and assisting in marketing aspects, providing opportunities for the exchange of information on technology and business trends.

## Resource Mobilization

2.19 KTDC mobilized ₩318.2 billion during the period 1984-1989 to accomodate the significant expansion of its financing activities. KTDC successfully mobilized resources in the amount of ₩28 billion as equity, borrowed from the government ₩79 billion and floated Technology Development Debentures in the private capital market totalling ₩96 billion during the same period. For foreign currency resources, KTDC induced three loans from the Bank equivalent to US\$150 million and borrowed the foreign currency of US\$34.7 million from the KOREA LONG-TERM CREDIT BANK for the prepayment of the first bank Loan.

2.20 Besides, investment partnership fund has been introduced as a new financial resource. The partnership is formed by soliciting investment funds from limited investors including institutional investors such as pension funds and financial institutions for the purpose of equity-type investment in new start-up companies or existing small and medium-sized companies. KTDC acts as a general partner responsible for management and investment operations of the partnership fund. Partners are distributed with capital gains or losses from the investment operations in accordance with the proportion of the partnership interest. As this partnership is regarded as a seperate and independent entity, seperate management and administration is handled by KTDC. KTDC formed three partnership funds in the amount of ₩2.0 billion in 1987 and ₩3.5 billion in 1988 and ₩5.0 billion in 1989.

## Financial Performance

2.21 Annex 10 summarizes KTDC's actual overall financial performance. KTDC recorded the first net profit in 1984.

In 1989, it accomplished a remarkable net profit of ₩5.6 billion without the government's interest rate differential subsidies.

## 3. Accomplishments

2.22 KTDC is now widely considered as a leading technology financing institution in Korea and many countries are trying to establish a similar organization. Venture financing and R&D financing activities draw wide attention and the promotion of these financing activities constitutes an important element of Korea's industrial technology development drive. In addition to KTDC, three other venture financing corporations namely, Korea Technology Financing Corporation(KTFC), Korea Development Investment Corporation(KDIC), and Korea Technology Advancement Corporation(KTAC) have been encouraged under the New Technology Financing Support Act to promote venture capital business. Furthermore, 35 other start-up investment companies in the nature of KTIC have been created up to now.

2.23 KTDC's activities in the venture capital field have attracted a number of new private venture capital companies which benefitted either directly or indirectly from KTDC's past achievements and contributions in the field of R&D financing. In a sense, KTDC has been a pioneer in showing the way and

nurturing the climate in the technology financing area. Also, it has been an important institution responsible for the realization of Korea's objectives in the field of science and technology.

2.24 Regarding its operational aspect, KTDC, by and large took a prudent investment strategy in its initial stage with emphasis on nurturing the technology development climate in Korea's industries and slowly injected the venture capital concept for the sound management and financial viability of technology ventures. After KTDC earned a well-established position, it shifted to a more aggressive financing strategy by employing more risk-sharing instruments.



### III. THE BANK'S CONTRIBUTION TO KTDC

3.1 From 1984 to 1989, KTDC approved 1,304 projects amounting to ₩391.1 billion, out of which ₩99.6 billion was in foreign currency. For foreign currency resources, KTDC relied mainly on the three Bank Loans equivalent to US\$150 million.

3.2 The approval of the Bank Loan to KTDC encouraged both the government and the private sector shareholders to accelerate their subscriptions.

3.3 The Bank suggested to KTDC to strengthen its supervision/follow-up functions of venture financing to increase the weight of venture financing and to enhance its profitability. The suggestion helped KTDC to develop more specific and efficient supervision/follow up systems.

3.4 As a result of the above mentioned, the Bank's contribution to KTDC, KTDC is now maintaining its leading position in the field of R&D financing and venture capital business in Korea in spite of emergence of many domestic competitors. In addition, the Bank's and KTDC's experience gained during the evolution and implementation of the project would be useful in assisting other countries planning to establish R&D financing institutions. KTDC strongly hopes the bank's cooperation and support will be continued in 1990's.

#### IV. LESSONS LEARNED FROM THE PROJECT

Several important lessons have emerged from the evolution and implementation of the project.

4.1 The role of the government and its strategies are crucial to the success of this project. To date, the government has initiated an impressive array of policies and administrative measures to facilitate the development of industrial technology. Policies and administrative measures have been to : (a) encourage R&D investments by industry as much as possible ; (b) liberalize foreign technology imports : (c) increase the linkage between industry and non-profit research institutes : and (d) create suitable financing mechanisms for R&D activities and venture capital business (including KTDC), particularly for SMI. Furthermore, to complement these measures, the government has increased education sector investments to improve the quality as well as the quantity of technical manpower.

4.2 The government is the largest shareholder of KTDC. But the government allows KTDC to operate in an autonomous manner and give it the ability and means to attract and retain human resources of high caliber and entrepreneurship. This is a key to the projects' success because KTDC had to respond quickly to its customer's changing needs and environment.

4.3 There has been an increasing number of would-be entrepreneurs who are aspiring to begin businesses and private innovators who are dreaming of

commercializing their R&D projects. Existing small and medium-sized companies are continuously trying to improve their technology capability to cope with severer competition in the local and international market. Their ardent wishes and efforts are decisive to the project's success. But, it is true that some of Korean entrepreneurs are concerned with a erosion of potential profits and dilution of their ownership.

4.4 Fluctuation of exchange rate between currencies in the pool of the bank loan has been passed on to the subborrowers of the Loan. The fluctuation risk was reported as a deterrent for the greater use of the Loan. KTDC hopes the fluctuation more stable.

PROJECT COMPLETION REPORT

KOREA

SECOND TECHNOLOGY DEVELOPMENT PROJECT  
(LOAN 2473-KO)

PART III: STATISTICAL INFORMATION

**SECOND TECHNOLOGY DEVELOPMENT PROJECT**  
(LOAN 2473-KO)

**Table 1: RELATED BANK LOANS**

Loan No.	Title	Purpose	Approval	Status	Comments
167C	Electronics Technology	Develop capacity of KIET and support local electronics industry.	1979	Closed	Loan to IBK, CNB, KLB and SMIPC.
2112	Technology Development	Support institutional development of KTDC.	1982	Closed	
2215	SMMI	Finance SMI subprojects and TA SMI machinery industry.	1982	Closed	
2427	Science & Technology Education	Improve quality of education in science and engineering.	1984	Closed	
2515	SMI	Finance SMI subprojects and TA to SMIPC.	1985	Closed	Loan to CNB and SMIPC.
2913	Technology Development III	Continue institutional support of KTDC.	1988	Supervision	Closing date is 12/31/92
3037	Technology Advancement	Strengthen industrial development in SMIs by enhancing R&D education	1989	Supervision	Loan to KIT, ITC and KERI
3202	Technology Advancement II	Improve R&D capacities of science, engineering, biotech, etc.	1990	Supervision	Loan to KAIST, GEC, KSRI and KIER
3203	University Science &	Assist selected universities in basic research programs in science and technology	1990	Supervision	Loan to KAIST, GEC, KSRI and KIER

KIET - Korea Institute of Electronics Technology  
 IBK - Industrial Bank of Korea  
 CNB - Citizens National Bank  
 KLB - Korea Long Term Credit Bank  
 SMIPC - Small & Medium Industry Promotion Corporation  
 KIT - Korea Institute of Technology

ITC - Industrial Technology Center  
 KERI - Korea Electrotechnology Research Institute  
 KAIST - Korea Advanced Institute of Science and Technology  
 GEC - Genetic Engineering Center  
 KSRI - Korea Standards Research Institute  
 KIER - Korea Institute of Energy and Resources

**SECOND TECHNOLOGY DEVELOPMENT PROJECT**  
**(LOAN 2473-RO)**

**Table 2: PROJECT TIMETABLE**

<b>Item</b>	<b>Date Planned</b>	<b>Date Actual</b>
<b>Identification Mission</b>	<b>May 1983</b>	<b>May 1983</b>
<b>Preparation</b>	<b>October 1983</b>	<b>October 1983</b>
<b>Pre-Appraisal Mission</b>	<b>-</b>	<b>-</b>
<b>Appraisal Mission</b>	<b>January 1984</b>	<b>January 1984</b>
<b>Post-Appraisal Mission</b>	<b>-</b>	<b>-</b>
<b>Loan Negotiations</b>	<b>July 1984</b>	<b>August 1984</b>
<b>Board Approval</b>	<b>September 1984</b>	<b>October 1984</b>
<b>Loan Signature</b>	<b>November 1984</b>	<b>November 1984</b>
<b>Loan Effectiveness</b>	<b>January 1985</b>	<b>January 1985</b>
<b>Loan Closing</b>	<b>June 1989</b>	<b>June 1989</b>
<b>Loan Completion</b>	<b>June 1987</b>	<b>June 1987</b>

SECOND TECHNOLOGY DEVELOPMENT PROJECT  
(LOAN 2473-KO)

Table 3: CUMULATIVE AND ACTUAL DISBURSEMENTS  
(US\$ Millions)

	1985	1986	1987	1988	1989	1990
Appraisal Estimate	7.5	21.5	39.0	48.0	50.0	50.0
Revised Estimate	3.0	14.8	28.5	41.5	50.0	50.0
Actual	5.7	16.6	33.3	44.0	45.2	45.2
Actual as a % of Estimate	76.0	77.2	85.4	91.7	90.4	90.4

Date of Final Disbursement: June 28, 1989

SECOND TECHNOLOGY DEVELOPMENT PROJECT  
(LOAN 2473-KO)

Table 4.1: LIST OF SUBPROJECTS FINANCED UNDER THE LOAN

<u>CATEGORY</u>	<u>COMPANY NAME</u>	<u>PROJECT NAME</u>	<u>DISBURSEMENT(US\$)</u>
2-A-01	DONG BANG OIL	Development of the newest soybean processing system	580,429.13
2-A-02	HANNAM CHEMICAL CO.	Technology Import of Continuous Mass Polymerization Process of San Resin	1,440,418.80
2-A-03	YUKONG LTD.	Purchase of Equipments for R&D Center	664,862.53
2-A-04	YUKONG LTD.	Development of heavy oil cracking process	885,810.33
2-A-05	SAMSUNG PRECISION	Development of Die Making Process of Semiconductor Lead Frames	1,515,901.79
2-A-06	SAMSUNG PRECISION	Development of Plating Process for Semiconductor Lead Frames	1,037,142.23
2-A-07	KOREA SHIPBUILDING	Development of Stainless Steel Electric Rail Car	728,966.86
2-A-08	CHEIL SUGAR & CO., LTD.	The Development of $\beta$ -Interferon	807,725.42
2-A-10	DAEWOO ELECTRONICS	Development of Tantalum Electrolytic Capacitors	1,512,679.46
2-A-12	ORIENTAL CHEM IND.	Development of Manufacturing Process of Magnetic Recording Materials and Piezo-electric Ceramics	457,094.75
2-A-13	HYUNDAI MOTOR CO.	The Development of Middle sized Gasoline Engine	1,511,038.86
2-A-16	HANKUK GLASS INDUSTR	Purchase of R&D Equipments	679,768.41
2-A-18	DONG AH PRECISION CO.	Development of Y-Bar and Z-Plate Crystal Quartz Growing Processes	2,472,076.88
2-A-19	HAN-IL E-HWA CO.	The Development of the Automobile Interior Trim parts(2)	591,987.42
2-A-20	KIA MOTORS CORPORATI	Import of Technology/Technical Assistance for Engineering & Establishment of Metal Finishing Plant	2,426,738.94
2-A-21	KIA MOTORS CORP.	Import of Technology/Technical Assistance for Engineering & Establishment of Automatic Conveying System in Metal Finishing Plant	668,822.00
2-A-22	CHEIL SUGAR & CO.	Import of Interferon-Alpha production technology by recombinant dna method	785,728.72
2-A-23	ORDEC CO., LTD.	Technology import of ceramic monolithic catalysts for the automotive emission control	1,235,445.07
2-A-25	SUNG MOON ELECTRO	Localization of thin metallized film for capacitor	1,017,736.18
2-A-26	SUNKYONG CO.	Technology training for plant design & engineering capability enhancement	550,780.78
2-A-27	CHEIL SUGAR CO.	Import of Interferon-Gamma production technology by recombinant DNA method	1,221,178.82
2-A-28	CHEIL SUGAR CO.	Import of hepatitis B vaccine production technology by recombinant DNA method	1,119,413.92
2-A-29	KOREA IND MOTOR CO.	The development of high efficiency induction motors	764,864.28
2-A-30	KORSIL CO., LTD.	The import of wafer manufacturing technology	1,500,000.00



CATEGORY	COMPANY NAME	PROJECT NAME	DISBURSEMENT(US\$)
2-A-31	DAEWOO AUTOMOTIVE CO.	The Development of start Motor parts for Heavy Duty Vehicle	1,200,000.00
2-A-35	HANKUK ENGELHARD	Improvement of manufacturing process of monolithic 3-way catalyst for automotive emission control	1,391,351.35
2-A-37	DAEDONG HEAVY INDUST	The Localization of Unit for Special purpose Machine	1,000,000.00
2-B-01	OTTOGI FOODS CO., LTD.	Development of raw EGG processing technology	150,748.83
2-B-02	OTTOGI FOODS CO., LTD.	Development of Food Additives with Domestic Agricultural Products	305,835.88
2-B-03	SONG WOUN INDUSTRIAL	Development of Manufacturing Process of Antioxidants Including Hindered Phenol Group	227,506.94
2-B-04	YOUL CHON PRINTING	Development of High Grade Plastic Films	242,164.02
2-B-06	DAEWOO ELECTRONIC CO.	Importation of Capacitor Manufacturing Technology	231,308.11
2-B-07	DAEWOO ELECTRONIC CO.	Localization High Voltage Capacitor for Microwave Oven	368,039.01
2-B-08	SUNG MOON ELECTRO	Localization of Metalized Film for Capacitor	797,007.63
2-B-09	HAN IL E-WHA CO., LTD.	The Development of the Automobile Interior Trim parts(1)	97,911.26
2-B-10	KEOWHA COMPANY	The Import of R&D Equipments	378,416.15
2-B-11	GOLD STAR HONEYWELL	Localization of Automatic Controls Products and Systems	300,588.93
2-B-13	GOLD STAR INSTRUMENT	Localization of the SAW Filter	101,108.31
2-B-14	SUNG WOUN INDUSTRIAL	Development of Polyester Based Polyurethane Polymer(Moldable Thermoplastics) Manufacturing Process	80,899.89
2-B-16	GOLD STAR PRECISION	Development of Micro Precision Motors for VTR's	55,609.37
2-B-17	HAN IL E-WHA CO., LTD.	The import of Manufacturing Technology for Bus Seat	50,554.15
2-B-18	KOREA HEAVY INDUSTRY	The Development of Partial Integral Rotor	452,522.32
2-B-19	SAMSHIN SPINNING CO.	Development of a Fancy Yarn Spinning Process	325,108.83
2-B-20	KIRIN SYSTEM CO., LTD.	The development of Point of Sale System and Management Information	163,820.67
2-B-22	DOOSAN COMPUTER CORP	Development for Localization of Laser Printer	108,962.43
2-B-23	DOOSAN COMPUTER CORP	Development of Chinese Character Processing CRT Terminals	62,923.50
2-B-24	HOEHOON TRADING CO.	The Development of WEATHER STRIPS for the Automobiles	93,979.72
2-B-25	KIA MOTORS CORP	Technical Assistance for Engineering of Paint Circulation Supply System	116,416.39
2-B-26	KIA MOTORS CORP	Technical Assistance for Engineering of Electrostatic Automatic Spraying System	224,976.40
2-B-27	SUNG SAN CO.	The Development of Lamp for 470K/T Car	420,390.56
-B-28	SUNGMI TELECOM ELECT	The Equipment Procurement for the R&D Activities	71,152.14
-B-29	GOLD STAR MICRONIS	The development of shadow masks for new model C-TV's	275,135.47

CATEGORY	COMPANY NAME	PROJECT NAME	DISBURSEMENT(US\$)
2-B-30	A-POINT CO., LTD.	The development of factory management automation system	69,698.02
2-B-32	DAE-SUNG ELECTRIC	The Development of printer tractor assembly and parts	149,976.06
2-B-33	ORIENTAL CHEMICAL	Technology Import of Electroless Copper Plating Solution and Solder Resist for Through-hole Printed Circuit Boards	402,902.75
2-B-34	KOREA HEAVY INDUSTRI	The Development of Design Technology for Power Plant Equipment	473,469.29
2-B-35	CHANG WON LTD.	The Development of Ferrite powder and ceramic materials	489,905.7
2-B-36	SAM HWA CAPACITOR CO.	The Development of High-Voltage Ceramic Disc Capacitors	308,793.35
2-B-37	SAM HWA CAPACITOR CO.	The Development of Compound for Ceramic Disc Capacitors	190,190.00
2-B-38	KOREA BERAL LTD.	The Development of Break Friction Materials of Automobile	501,781.41
2-B-39	YOUNG SUH PRECISION	The Development of Micro DC Brushless Fan Motors	226,080.46
2-B-40	SAMSUNG CHEMICAL IND	Manufacturing process improvement of Non-Toxic PVC film	181,400.65
2-B-41	DAELIM ENG CO.	Technology Import of Tray and Packing	333,354.22
2-B-42	CHOKWANG PANT IND.	The Development of Etching Primer for PCB	146,680.44
2-B-43	KO-SHIN ENERGY MGT	Development of Auto-control Equipments for the Industrial Boilers	199,924.33
2-B-44	KOREA GREEN CROSS	Commercialization of I.V Catheter	150,000.00
2-B-45	SAM SUNG WATCH CO	Development of Plastic Watch	167,247.74
2-B-46	KYUNG NONG CORP	Development of New Horticultural Fungicides	459,406.83
2-B-47	YUYU IND CO., LTD	Development of Ticlopidine	80,021.34
2-B-50	KOREA DENKI ONKYO	The Development of DY, FBT for new model TV	198,558.56
2-B-51	KOREA SEAL MASTER CO.	Development of Siliconized Graphite for Mechanical Seal	100,000.00
2-B-52	SUNGMI TELECOM ELECT	The Technology Import of Digital Microwave Radio Telecommunication Equipment	420,000.00
2-B-53	HI SEONG METAL IND	Development of molybden parts for the magnetron of micro wave oven	499,076.86
2-B-54	GYUNG GI GELATIN CO.	Development of gelatin for hard capsule	140,000.00
2-B-55	SUNG SAN CO., LTD.	The Development of Rear Comb. Lamp for GM H-Car	248,198.20
2-B-56	SAE RON BUL INC.	Development of Head Lamp & Combination Lamp for Exporting Automobiles	80,000.00
2-B-57	DONG SEON SPECIAL	Development of E.C.B.(Ethylene Copolymer Bitumin)	119,135.14
2-B-58	CHOSUN BREWERY CO.	Purchase of R&D Equipments	29,691.35
2-B-59	OVAL KOREA CO., LTD.	Development of tank truck lading system	300,000.00
2-B-60	YOUNGBO CHEMICAL CO.	Development of Block Type Cross-Linked Polyethylene Foam	121,968.11
2-B-61	KOREA MULTISUN CO.	Development of PP-C Pipe Manufacturing System	100,000.00

<u>CATEGORY</u>	<u>COMPANY NAME</u>	<u>PROJECT NAME</u>	<u>DISBURSEMENT(US\$)</u>
2-B-62	SAM SUNG WATCH CO.	Development of Movement for Wrist Watch	398,918.92
2-B-63	ORIENT PRECISION CO.	The Development of Electronic Hemomanometer	500,000.00
2-B-64	ORIENT PRECISION CO.	The Automation of Heat-Run Process	500,000.00
2-B-65	NAE WAE ELECTRIC CO.	The Development of Reminder IC	255,000.00
2-B-67	SOE HAE IND. CO.	Development of Doors for Automobiles	496,396.40
2-B-68	DONGSUNG CHEM IND. CO.	The Development of Special Oil and Paper Additive	200,000.00
2-B-69	KUKJE PHARMA IND. CO.	Improvement of manufacturing process of antibiotics	200,000.00
2-B-70	HANALL PHARM CO.	Development of Cefoxitin	99,610.80
		Total	45,040,436.79

CATEGORY	COMPANY NAME	Project Cost		Approval Amount	
		Mil.Won(A)	Thou.US (B)	Mil.Won(C)	Thou.US (D)
2-A-01	DONG BANG OIL	813	624	480	600
2-A-02	HANNAM CHEMICAL Co.	2,165	388	500	1,500
2-A-03	YUKONG LTD.	824	1,847	500	1,600
2-A-04	YUKONG LTD.	813	1,753	500	1,500
2-A-05	SAMSUNG PRECISION	687	1,589	500	1,500
2-A-06	SAMSUNG PRECISION	455	1,000	0	1,000
2-A-07	KOREA SHIPBUILDING	690	850	600	850
2-A-08	CHEIL SUGAR & CO., LTD.	757	1,031	500	800
2-A-10	DAEWOO ELECTRONICS	825	1,832	500	1,500
2-A-12	ORIENTAL CHEM IND.	421	600	330	600
2-A-13	HYUNDAI MOTOR CO.	13,043	13,038	500	1,500
2-A-16	HANKUK GLASS INDUSTR	70	830	0	830
2-A-18	DONG AH PRECISION CO.	591	2,730	500	2,500
2-A-19	HAN-IL E-HWA CO.	350	600	300	600
2-A-20	KIA MOTORS CORPORATI	0	2,350	0	2,350
2-A-21	KIA MOTORS CORP.	0	740	0	740
2-A-22	CHEIL SUGAR & CO.	0	800	0	800
2-A-23	ORDEG CO., LTD.	5,174	2,813	500	1,230
2-A-25	SUNG MOON ELECTRO	210	910	0	910
2-A-26	SUNKYONG CO.	50	560	0	560
2-A-27	CHEIL SUGAR CO.	0	1,439	0	1,200

CATEGORY	COMPANY NAME	Project Cost		Approval Amount	
		Mill.Won(A)	Thou.US (B)	Mill.Won(C)	Thou.US (D)
2-A-28	CHEIL SUGAR CO.	587	2,270	470	1,100
2-A-29	KOREA IND MOTOR CO.	619	1,000	500	1,000
2-A-30	KORSIL CO., LTD.	0	5,166	0	1,500
2-A-31	DAEWOO AUTOMOTIVE CO.	1,907	0	500	1,200
2-A-35	HANKUK ENGELHARD	398	1,400	300	1,400
2-A-37	DAEDONG HEAVY INDUST	587	514	0	1,000
2-B-01	OTTOGI FOODS CO., LTD.	311	175	220	175
2-B-02	OTTOGI FOODS CO., LTD.	412	325	280	325
2-B-03	SONG WOUN INDUSTRIAL	570	250	450	250
2-B-04	YOUL CHON PRINTING	1,839	3,612	250	250
2-B-06	DAEWOO ELECTRONIC CO.	0	230	0	230
2-B-07	DAEWOO ELECTRONIC CO.	113	390	100	390
2-B-08	SUNG MOON ELECTRO	450	500	200	500
2-B-09	HAN-IL E-WHA CO., LTD.	135	97	100	97
2-B-10	KEOWHA COMPANY	0	425	0	425
2-B-11	GOLD STAR HONEYWELL	369	1,032	300	450
2-B-13	GOLD STAR INSTRUMENT	244	220	200	100
2-B-14	SUNG WOUN INDUSTRIAL	256	80	200	80
2-B-16	GOLD STAR PRECISION	309	170	250	170
2-B-17	HAN-IL E-WHA CO., LTD.	0	50	0	50
2-B-18	KOREA HEAVY INDUSTRY	374	450	300	450
-B-19	SANSHIN SPINNING CO.	120	300	90	300
-B-20	KIRIN SYSTEM CO., LTD.	318	170	250	170

CATEGORY	COMPANY NAME	Project Cost		Approval Amount	
		Mil.Won(A)	Thou.US (B)	Mil.Won(C)	Thou.US (D)
2-B-22	DOOSAN COMPUTER CORP	293	110	250	110
2-B-23	DOOSAN COMPUTER CORP	301	60	250	60
2-B-24	BOEHOOY TRADING CO.	117	200	100	200
2-B-25	KIA MOTORS CORP	0	270	0	270
2-B-26	KIA MOTORS CORP	0	400	0	400
2-B-27	SUNG SAN CO.	1,040	420	1,040	420
2-B-28	SUNGMI TELECOM ELECT	27	75	20	75
2-B-29	GOLD STAR MICROMIS	557	270	450	270
2-B-30	A-POINT CO., LTD.	90	70	50	70
2-B-32	DAE-SUNG ELECTRIC	227	150	150	150
2-B-33	ORIENTAL CHEMICAL	490	400	0	400
2-B-34	KOREA HEAVY INDUSTRI	0	470	0	470
2-B-35	CHANG WON LTD.	50	500	500	500
2-B-36	SAM HWA CAPACITOR CO.	666	300	490	300
2-B-37	SAM HWA CAPACITOR CO.	580	200	450	200
2-B-38	KOREA BERAL LTD.	1,725	500	500	500
2-B-39	YOUNG SUH PRECISION	646	132	0	230
2-B-40	SAMSUNG CHEMICAL IND	435	180	350	180
2-B-41	DAELIM ENG CO.	366	335	300	335
2-B-42	CHOKWANG PAIN IND.	747	0	350	150
2-B-43	KO-SHIN ENERGY MGT	425	200	300	200
2-B-44	KOREA GREEN CROSS	400	0	200	150
2-B-45	SAM SUNG WATCH CO.	572	234	450	200

CATEGORY	COMPANY NAME	Project Cost		Approval Amount	
		Mill.Won(A)	Thou.US (B)	Mill.Won(C)	Thou.US (D)
2-B-46	KYUNG NONG CORP	313	486	250	450
2-B-47	YUYU IND CO., LTD.	388	0	250	100
2-B-50	KOREA DENKI ONKYO	647	0	485	200
2-B-51	KOREA SEAL MASTER CO.	279	100	200	100
2-B-52	SUNGMI TELECOM ELECT	0	425	0	425
2-B-53	HI SEONG METAL IND	0	500	0	500
2-B-54	GYUNG GI GELATIN CO.	440	752	370	140
2-B-55	SUNG SAN CO., LTD.	536	250	536	250
2-B-56	SAE RON BUL INC.	519	100	400	100
2-B-57	DONG SEON SPECIAL	255	120	200	120
2-B-58	CHOSUN BREWERY CO.	36	185	30	185
2-B-59	OVAL KOREA CO., LTD.	325	300	280	300
2-B-60	YOUNGEO CHEMICAL CO.	371	200	300	200
2-B-61	KOREA MULTISUN CO.	350	0	200	100
2-B-62	SAM SUNG WATCH CO.	812	0	400	400
2-B-63	ORIENT PRECISION CO.	512	500	430	500
-B-64	ORIENT PRECISION CO.	544	500	480	500
-B-65	NAE WAE ELECTRIC CO.	355	255	300	255
-B-67	SOE HAE IND. CO.	630	500	450	500
-B-68	DONGSUNG CHEM IND. CO.	828	0	450	200
B-69	KUKJE PHARMA IND. CO.	642	0	300	200
B-70	HANALL PHARM CO.	189	113	150	100
Grand-Total		55,792	67,522	23,691	47,687

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**Table 4.2: DISTRIBUTION OF SUBPROJECTS**

(1) Number of Projects and Amount by Industry Sector

Industry Sector	No. of Projects	Amount
Machinery / Metal	24	13,098,563.04
Electronics / Electrical	28	13,203,352.82
Chemical / Others	37	18,738,520.93
Total	89	45,040,436.79

(2) Number of Projects and Amount by Project Type

R & D Type	No. of Projects	Amount
Purchasing of R & D equipments	8	3,662,715.22
R & D	49	22,012,488.28
Improvement of manufacturing process	7	2,953,821.91
Commercialization of new product	7	2,625,804.47
Technology import	18	13,785,606.91
Total	89	45,040,436.79

(3) Number of Projects and Amount by Company Size

Company Size	No. of Projects	Amount
Large	47	27,171,049.22
Small & Medium	42	17,869,387.57
Total	89	45,040,436.79

(4) Number of Projects and Amount by Financing Instrument

Financing Instrument	No. of Projects	Amount
Conventional Loan	89	45,040,436.79

(5) Number of Projects and Amount by Subloan Size

Subloan Size	No. of Projects	Amount
A Subloan	27	29,717,962.93
B Subloan	62	15,322,473.86
Total	89	45,040,436.79



(6) Number of Projects and Amount by Region

Region	No. of Projects	Amount
Seoul	21	8,357,542.10
Kyung-Ki	31	16,455,706.86
Kyung-Nam	19	14,521,863.77
Kyung-Buk	3	798,802.86
Pusan	5	1,548,043.17
Taegu	3	748,583.76
Chun-Nam	3	723,340.32
Inchon	4	1,886,528.95
Total	89	45,040,436.79

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**Table 4.3: SELECTED EXAMPLES OF KTDC SUPPORTED SUBPROJECTS**

1. (1) Company Name : Nae-Wae Electric Co., Ltd.  
(2) Project Name : Development of Reminder IC  
(3) Type and Amount of KTDC Financing : Conventional Loan (US\$ 255 Thou.,  
₩300M11.)  
(4) Brief Discription of the Project :  
The project is a kind of ASIC (Application Specific IC) named as "Reminder IC", which can store sound information and repeat that information if requested. This IC which consists of A/D, D/A converters, memory unit and control unit is essential to the manufacturing of auto-answering telephone set, language training equipment, cassette recorder and toys, etc. KTDC provided a comprehensive support for the growth of the company , which encompassed managerial and financial consultation even including the ground work for going public.
2. (1) Company Name : Sung Moon Electronics Co., LTD.  
(2) Project Name : Localization of thin metallized film for capacitor  
(3) Type and Amount of KYDC Financing : Conventional Loan(US\$ 1,018 Thou.)  
(4) Brief Description of the Project :  
KTDC financed technology development projects from start-up to commercialization stage for the company. Among them, Metallized film

is made through the process of putting a super-thin membranous metal on the ordinary film under a vacuum condition. Special know-how in the operation and treatment is required for this high quality product. Metallized film is one of the essential materials for capacitors, comprising 35% of the total material costs of these items. Until now, metallized film has been imported from Japan or West Germany, and local capacitor makers faced a difficulty in securing a stable supply of the product. Though the localization of metallized film, domestic capacitor makers can improve their international competitiveness, and import substitution effect is expected.

3. (1) Company Name : Kia Motors Corp.
- (2) Project Name : Import of Technology / Technical assistance for Engineering & Establishment of Automatic Conveying System in Metal Finishing Plant.
- (3) Type and Amount of KTDC Financing : Conventional Loan (US\$ 669 Thou.)
- (4) Brief Description of the Project :
- KTDC has financed KIA MOTORS CORPORATION to build up a new painting shop(Metal Finishing Plant). Kia has successfully established automatic conveying system in metal finishing shop at Sohari Plant by making all the process-painting, drying, rinsing, colling, test and assembling. Continuously, KIA has increased the productivity and the quality of the product and has enhanced the technology in the field of conveying system under the technical assistance of YAKANISHI in Japan.

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**Table 4.4: KTDC INSTITUTIONAL PERFORMANCE**

**1. Staff Training**

**a. Overseas Training**

	1984	1985	1986	1987	1988	1989
o Duration						
- Long-term	3	2	3	2	-	1
- Short-term	1	2	1	2	2	6
o Field						
- Financing R&D/Venture Capital Operations	3	4	3	3	2	6
- Technological innovation/ Small business management	1	-	1	1	-	1
o Destination						
- U. S. A.	4	2	2	1	-	2
- Europe	-	-	-	-	-	-
- Japan	-	-	1	1	1	1
- South-East Asia	-	2	1	2	1	4

**b. Domestic Training**

	1984	1985	1986	1987	1988	1989
(1) External Courses (Short-term only)						
o Finance & Investment	-	-	-	1	6	12
o Capital Market (KSTI)	-	-	-	-	5	8
o Marketing (KMI)	-	-	-	-	2	1
o Planning & Administration (KPC, FKI etc)	-	-	-	2	2	2
o M I S	-	-	-	-	2	6
(2) Graduate School	-	1	2	2	3	2
(3) OJT in Portfolio companies	-	-	2	2	9	6
(4) New employed staffs Orientation	-	-	-	-	6	5
(5) Group Training	-	12	-	52	70	-

2. The Use of Consultancy Services

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Name of Consultant	Country of Origin	Institute Assigned	Field of Activity	Duration From To
Frank S. Bayley	U.S.A.	Venture Capital Invest	The International Strategy of Venture Capital	'84.10.11 - '84.10.12
Arthur C. Patterson	U.S.A.	Citicorp Venture Capital Ltd.	"	"
George Hara	U.S.A.	Shotosa international Tokyo & CA	"	"
Y.S. Chang	U.S.A.	Asian Management Center Boston Univ.	The Review of Organization and MIS	'85.3 - '85.12
Y.H. Lee	U.S.A.	"	"	"
K.N. Rao	U.S.A.	"	"	"
William A. Ward	U.S.A.	Institute for Development Programs	Appraisal Technique	'87.5.11 - '87.5.15
Paul Toal	U.S.A.	New Product Dev. Industrial Dev. Authority of Ireland	"	"

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**Table 4.5: KTDC FINANCED R&D PROJECTS PERFORMED BY PUBLIC RESEARCH INSTITUTE**  
**(Won Million)**

Name of the Institute	No. of Projects	Total Budget	Amount of KTDC Financing
KAIST	16	6,324	4,580
KIMM	17	4,999	4,065
KRICT	6	4,937	4,043
KIER	4	895	720
KGTRI	1	654	280
Total	44	17,809	13,688

**\* Abbreviations \***

**KAIST : Korea Advanced Institute of Science and Technology**

**KIMM : Korea Institute of Machinery and Metals**

**KRICT : Korea Research Institute of Chemical Technology**

**KIER : Korea Institute of Energy Resources**

**KGTRI : Korea Ginseng and Tobacco Research Institute**

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**Table 5.1: ESTIMATED AND ACTUAL AMOUNT OF FINANCIAL SUPPORT (CURRENCY AND INSTRUMENT)**  
(Won Billion)

	1984		1985		1986		1987		1988		1989		Total(84-89)	
	Est	Actual	Est	Actual	Est	Actual	Est	Actual	Est	Actual	Est	Actual	Est	Actual
<b>Approval basis</b>														
<b>Local Currency</b>														
Conventional Loan	35.1	35.0	38.7	36.3	41.6	43.5	45.9	44.9	48.0	43.7	52.0	44.5	261.3	247.9
Conditional Loan	0.9	0.6	0.9	1.8	1.5	1.9	1.7	1.0	1.9	1.6	2.6	0.0	9.4	6.9
Equity														
Convertible Bonds	0	1.5	0	1.2	0	2.9	0	2.8	0	1.4	0	3.5	0	13.3
Equity Shares	3.9	0.8	2.4	1.3	5.9	3.9	8.4	3.3	10.2	4.0	10.4	10.1	43.1	23.4
Subtotal	3.9	2.3	4.4	2.5	5.9	6.8	8.4	6.1	10.2	5.4	10.4	13.6	43.1	36.7
Total	39.8	37.9	44.0	40.6	49.0	52.2	56.0	52.0	60.0	50.7	63.0	58.1	313.8	291.5
<b>Foreign Currency</b>														
Conventional Loan	15.2	18.7	16.9	20.8	18.4	12.2	20.0	15.0	19.9	17.0	19.8	15.5	110.1	99.2
Conditional Loan	0	0.0	0.2	0.0	0.4	0.0	0.4	0.0	0.4	0.0	0.6		2.1	0.0
Equity														
Convertible Bonds	0	0.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.4
Equity Shares	0	0.0	0.9	0.0	1.2	0.0	1.5	0.0	1.8	0.0	1.5	0.0	6.9	0.0
Subtotal	0	0.4	0.9	0.0	1.2	0.0	1.5	0.0	1.8	0.0	1.5	0.0	6.9	0.4
Total	15.2	19.1	18.0	20.8	20.0	12.2	21.9	15.0	22.0	17.0	22.0	15.5	119.1	99.6
<b>Total</b>														
Conventional Loan	50.3	53.7	55.6	57.1	60.0	55.7	65.9	59.9	67.8	60.7	71.8	60.0	371.4	347.1
Conditional Loan	0.9	0.6	1.1	1.8	1.9	1.9	2.1	1.0	2.2	1.6	3.3	0.0	11.5	6.9
Equity														
Convertible Bonds	0	1.9	0	1.2	0	2.9	0	2.8	0	1.4	0	3.5	0	13.7
Equity Shares	3.8	0.8	5.3	1.3	7.1	3.9	9.9	3.3	12.0	4.0	11.9	10.1	50.0	23.4
Subtotal	3.8	2.7	5.3	2.5	7.1	6.8	9.9	6.1	12.0	5.4	11.9	13.6	50.0	37.1
Total	55.0	57.0	62.0	61.4	69.0	64.4	77.9	67.0	82.0	67.7	87.0	73.6	432.9	391.1
<b>Disbursement basis</b>														
<b>Local Currency</b>														
Conventional Loan	30.5	26.7	36.9	38.8	40.2	48.4	43.8	42.7	47.0	46.1	50.0	48.6	248.4	251.3
Conditional Loan	1.0	0.6	0.9	0.8	1.2	1.7	1.6	1.8	1.7	1.7	2.3	0.1	8.7	6.5
Equity														
Convertible Bonds	0	1.5	0	1.0	0	2.7	0	3.0	0	1.2	0	3.9	0	13.3
Equity Shares	2.4	0.4	4.1	1.0	5.1	4.7	7.1	3.1	9.3	5.2	10.3	10.5	38.3	24.9
Subtotal	2.4	1.9	4.1	2.0	5.1	7.4	7.1	6.1	9.3	6.4	10.3	14.4	38.3	38.2
Total	32.9	29.0	41.9	41.6	46.5	57.5	52.5	50.6	58.0	54.2	62.6	63.1	295.4	196.0
<b>Foreign Currency</b>														
Conventional Loan	16.2	15.7	18.5	17.8	16.7	14.6	18.3	12.6	19.3	16.4	19.9	16.6	108.9	93.7
Conditional Loan	0.2	0.0	0.1	0.0	0.3	0.0	0.4	0.0	0.4	0.0	0.6	0.0	2.0	0.0
Equity														
Convertible Bonds	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Equity Shares	0	0.0	0.4	0.0	1.0	0.0	1.4	0.0	1.7	0.0	1.6	0.0	6.1	0.0
Subtotal	0	0.0	0.4	0.0	1.0	0.0	1.4	0.0	1.7	0.0	1.6	0.0	6.1	0.0
Total	16.4	15.7	19.0	17.8	18.0	14.6	20.1	12.6	21.4	16.4	22.1	16.6	117.0	93.7
<b>Total</b>														
Conventional Loan	46.7	42.4	55.4	36.6	36.9	62.0	62.1	55.3	66.3	62.5	69.9	65.2	357.3	345.0
Conditional Loan	1.2	0.4	1.0	0.8	1.5	1.7	2.0	1.8	2.1	1.7	2.9	0.1	10.7	6.5
Equity														
Convertible Bonds	0	1.5	0	1.0	0	2.7	0	3.0	0	1.2	0	3.9	0	13.3
Equity Shares	2.4	0.4	4.5	1.0	6.1	4.7	8.5	3.1	11.0	5.2	11.9	10.5	44.4	24.9
Subtotal	2.4	1.9	4.5	2.0	6.1	7.4	8.5	6.1	11.0	6.4	11.9	14.4	44.4	38.2
Total	50.3	44.7	60.9	49.4	64.5	72.1	72.6	63.2	79.4	70.6	84.7	79.7	412.4	399.7

**SECOND TECHNOLOGY DEVELOPMENT PROJECT**  
(LOAN 2473-KO)

**Table 5.2: ESTIMATED AND ACTUAL AMOUNT OF FINANCIAL SUPPORT (COLLATERAL CONDITIONS)**  
(Won Billion)

(Approval basis)	1984		1985		1986		1987		1988		1989		Total(84-89)	
	Est	Actual	Est	Actual	Est	Actual	Est	Actual	Est	Actual	Est	Actual	Est	Actual
Conventional Loans														
With Collateral	n.a.	35.2	n.a.	37.6	n.a.	40.3	n.a.	47.1	n.a.	39.8	n.a.	33.7	n.a.	233.7
Without Collateral	n.a.	18.5	n.a.	19.5	n.a.	15.4	n.a.	12.8	n.a.	20.9	n.a.	26.3	n.a.	113.4
Subtotal	30.3	53.7	55.6	57.1	60.0	55.7	65.9	59.9	67.8	60.7	71.8	60.0	371.4	347.1
Conditional Loans	0.9	0.6	1.1	1.8	1.9	1.9	2.1	1.0	2.2	1.6	3.3	0.0	11.5	6.9
Equity Investments														
Convertible Bonds														
With Collateral	n.a.	1.8	n.a.	0.8	n.a.	2.3	n.a.	1.1	n.a.	0.7	n.a.	1.6	n.a.	8.3
Without Collateral	n.a.	0.1	n.a.	0.2	n.a.	0.5	n.a.	2.0	n.a.	0.7	n.a.	1.9	n.a.	5.4
Subtotal	n.a.	1.9	n.a.	1.0	n.a.	2.8	n.a.	3.1	n.a.	1.4	n.a.	3.5	n.a.	13.7
Equity Shares	3.8	0.8	5.3	1.5	7.1	4.0	9.9	3.0	12.0	4.0	11.9	10.1	50.0	23.4
Total	3.8	2.7	5.3	2.5	7.1	6.8	9.9	6.1	12.0	5.4	11.9	13.6	50.0	37.1
Grand-Total	55.0	57.0	62.0	61.4	69.0	64.4	77.9	67.0	82.0	67.7	87.0	73.6	432.9	391.1
No. of Projects	150	184	165	188	182	222	199	210	210	222	230	278	1,136	1,304
Avg. Fin. Amount/Project (Won Million)	367	310	376	327	379	290	391	319	390	305	378	265	381	300
[Proportion(%)]														
Conventional Loans														
With Collateral	n.a.	61.8	n.a.	61.2	n.a.	62.6	n.a.	70.3	n.a.	58.8	n.a.	45.8	n.a.	59.8
Without Collateral	n.a.	32.5	n.a.	31.8	n.a.	23.9	n.a.	19.1	n.a.	30.9	n.a.	35.7	n.a.	29.0
Subtotal	91.5	94.2	89.7	93.0	87.0	86.5	84.6	89.4	82.7	89.7	82.5	81.5	85.8	88.8
Conditional Loans	1.6	1.1	1.8	2.9	2.7	3.0	2.7	1.5	2.7	2.4	3.8	0.0	2.7	1.7
Equity Investments														
Convertible Bonds														
With Collateral	n.a.	3.2	n.a.	1.3	n.a.	3.6	n.a.	1.6	n.a.	1.0	n.a.	2.2	n.a.	2.1
Without Collateral	n.a.	0.2	n.a.	0.3	n.a.	0.8	n.a.	3.0	n.a.	1.0	n.a.	2.6	n.a.	1.4
Subtotal	n.a.	3.3	n.a.	1.6	n.a.	4.3	n.a.	4.6	n.a.	2.0	n.a.	4.8	n.a.	3.5
Equity Shares	n.a.	1.4	n.a.	2.4	n.a.	6.2	n.a.	4.5	n.a.	5.9	n.a.	13.7	n.a.	6.0
Total	0.9	4.7	8.5	4.1	10.3	10.6	12.7	9.1	14.6	7.9	13.7	18.5	11.5	9.5
Grand Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
With Collateral	n.a.	64.9	n.a.	62.5	n.a.	66.1	n.a.	71.9	n.a.	59.8	n.a.	48.0	n.a.	61.9
Without Collateral	n.a.	35.1	n.a.	37.5	n.a.	33.9	n.a.	28.1	n.a.	40.2	n.a.	52.0	n.a.	38.1



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**Table 5.3: ESTIMATED AND ACTUAL RESOURCE MOBILIZATION 1984-1989 /a**  
(Won Million)

December 31	1984		1985		1986		1987		1988		1989		Total(84-89)	
	Est.	Actual	Est.	Actual	Est.	Actual	Est.	Actual	Est.	Actual	Est.	Actual	Est.	Actual
<u>Local Resources</u>														
Equity														
Government	2,000	2,000	3,000	4,000	4,000	2,000	0	2,000	0	(3,699)	0	-	9,000	6,301
Private	2,000	6,155	6,300	643	5,000	6,400	5,000	0	5,000	6,099	3,000	2,400	26,300	21,697
Subtotal	4,000	8,155	9,300	4,643	9,000	8,400	5,000	2,000	5,000	2,400	3,000	2,400	35,300	27,998
Borrowings														
Government	2,000	2,000	18,000	5,000	18,000	10,000	0	20,000	0	27,000	0	15,000	38,000	79,000
Debentures /b	19,000	30,000	9,500	11,000	0	10,000	0	0	38,000	30,000	14,250	15,000	80,750	96,000
Other sources	0	0	0	0	0	0	0	0	0	960	0	678	0	1,638
Subtotal	21,000	32,000	27,500	16,000	18,000	20,000	0	20,000	38,000	57,960	14,250	30,678	118,750	176,638
<u>Foreign Resources</u>														
IBRD	16,439	15,996	19,049	18,606	18,038	12,101	20,088	12,438	21,396	15,251	22,110	12,145	117,120	86,535
BOK	0	0	0	0	0	0	0	0	0	27,022	0	0	0	27,022
Grand Total	41,439	56,151	55,849	39,247	45,038	40,501	25,088	34,438	64,396	102,633	39,360	45,223	271,170	318,193

/a Disbursement basis

/b Before discount

**SECOND TECHNOLOGY DEVELOPMENT PROJECT**  
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**Table 5.4: ESTIMATED AND ACTUAL FINANCIAL INDICATORS 1984-1989**

Years ending December 31	1984		1985		1986		1987		1988		1989	
	Est.	Actual	Est.	Actual	Est.	Actual	Est.	Actual	Est.	Actual	Est.	Actual
<b>Percentage of Average Total Assets</b>												
1. Gross Income <u>/a</u>	11.76	11.43	10.29	13.97	13.98	13.31	16.66	12.83	11.5	11.4	12.0	11.6
2. Financial Expenses <u>/b</u>	9.63	9.13	9.80	10.41	9.71	10.59	9.43	9.67	7.1	7.7	8.6	6.0
3. Gross Spread (1-2)	2.13	2.30	0.49	3.56	4.27	2.71	7.23	3.17	4.4	3.7	3.4	5.6
4. Administrative Expenses	4.34	1.85	3.34	1.34	3.19	1.28	3.20	1.30	1.3	1.5	0.9	1.7
5. Provision for Losses	n.a.	0.44	n.a.	0.48	n.a.	0.02	n.a.	0.10	0.3	0.2	0.1	0.2
6. Net Income before Taxes	-2.78	0.05	03.29	1.22	0.72	1.02	3.72	1.46	2.2	2.1	1.6	2.6
Net Income as % of Average Net Worth	13.30	0.20	-17.07	5.55	2.55	4.64	11.87	5.73	6.3	8.7	5.1	11.0
<b>Spread on Average LC Conventional Loans</b>												
Income/Avg. LC Conventional Loans(%) <u>/c</u>	n.a.	14.06	n.a.	14.34	n.a.	13.85	n.a.	13.70	12.05	12.49	n.a.	11.6
Fin. Expenses/Avg. LC Long-term Debt(%) <u>/d</u>	n.a.	11.25	n.a.	13.28	n.a.	12.81	n.a.	12.54	8.75	10.49	n.a.	8.8
Spread (%)	n.a.	2.81	n.a.	1.06	n.a.	1.04	n.a.	1.16	3.30	2.00	n.a.	2.8
<b>Spread on Average FC Conventional Loans</b>												
Income/Avg. FC Conventional Loans(%)	n.a.	15.94	n.a.	16.64	n.a.	14.52	n.a.	12.98	11.40	10.49	n.a.	9.60
Fin. Expenses/Avg. IBRD Borrowings(%)	n.a.	12.69	n.a.	12.49	n.a.	13.67	n.a.	11.68	9.90	8.98	n.a.	8.86
Spread (%)	n.a.	3.25	n.a.	4.14	n.a.	0.84	n.a.	1.30	1.50	1.51	n.a.	0.74
<b>Spread on Avg. Total Conventional Loans</b>												
Income/Avg. Total Conventional Loans(%)	15.72	14.75	15.67	15.20	15.65	14.12	15.65	13.41	11.80	11.75	14.45	10.90
Fin. Expenses/Avg. Total Long-term Debt(%)	12.45	11.69	12.16	13.00	12.80	13.16	12.75	12.19	9.22	9.92	12.34	8.69
Spread (%)	3.27	3.05	3.51	2.20	2.85	0.96	2.91	1.23	2.58	1.83	1.91	2.21
<b>PRO FORMA SPREAD W/O INTEREST SUPPORT ON :</b>												
Average LC Conventional Loans(%)	n.a.	-0.67	n.a.	-2.51	n.a.	-1.53	n.a.	-1.16	2.32	1.01	n.a.	0.0
Average FC Conventional Loans(%)	n.a.	-0.71	n.a.	0.59	n.a.	0.53	n.a.	1.07	1.29	1.49	n.a.	0.0
Average Total Conventional Loans(%)	n.a.	-0.60	n.a.	-1.36	n.a.	-0.70	n.a.	-0.26	1.90	1.20	n.a.	0.0
<b>Other Financial Ratios</b>												
Total Debt/Equity Ratio(times)	3.4	4.2	4.2	4.7	4.1	4.6	3.6	4.1	3.7	4.1	3.7	3.9
Long-term Debt/Equity Ratio(times)	3.4	4.0	4.2	4.5	3.8	3.8	3.4	2.3	3.1	3.3	3.5	3.4
Current Ratio(times)	n.a.	15.4	n.a.	9.4	n.a.	1.0	n.a.	0.3	n.a.	2.9	n.a.	4.3
Provisions/Total Portfolio(%)	n.a.	1.0	n.a.	1.0	n.a.	0.7	n.a.	0.6	n.a.	0.6	n.a.	0.4

/a Total Income-foreign Exchange Transaction Gains

/b Interest-Commitment Fees-Amortization

/c Income includes commitment fees

/d Financial Expenses include amortization of deferred charges

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**Table 5.5: ESTIMATED AND ACTUAL INCOME STATEMENTS 1984-1989**  
(Won Million)

Years ending December 31	1984		1985		1986		1987		1988		1989	
	Est	Actual	Est	Actual	Est	Actual	Est	Actual	Est	Actual	Est	Actual
<b>Income</b>												
Income on Conventional Loans												
Interest/commitment fees	8,332	5,677	13,014	10,749	20,049	17,076	22,154	19,259	23,116	18,601	24,387	18,601
GOK's interest rate support	0	1,869	0	3,293	0	2,279	0	2,394	0	1,035	0	0
Subtotal	8,332	7,546	13,014	14,042	20,049	19,355	22,154	21,653	23,116	19,636	24,387	18,601
Income on Conditional Loans												
Royalty	9	16	144	174	362	208	647	285	1,129	841	1,489	869
GOK's support	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal	9	16	144	174	362	208	647	285	1,129	841	1,489	869
Income on Equity Investment												
Interest income on convertible bonds	55	130	116	231	193	480	275	831	363	839	457	822
Dividend on equity shares	0	0	5	1	20	7	117	43	353	174	781	319
Capital gain on sales of equity shares	0	0	0	0	0	0	0	1	392	36	3,302	645
Subtotal	55	130	121	232	213	487	392	875	1,108	1,049	4,540	1,787
Income on Factoring	0	0	0	0	0	0	0	10	0	323	0	1,069
Interest income on liquid holdings	1,536	1,672	2,193	3,888	4,018	3,962	4,351	3,727	3,874	4,136	3,925	3,630
Foreign exchange translation gains/losses (net)	0	63	0	(376)	0	(529)	0	(441)	0	(360)	0	(140)
Other income (net)	0	92	0	83	0	71	0	150	0	223	0	360
Total Income	9,932	9,519	15,471	18,093	21,059	23,554	23,664	26,259	25,848	25,848	30,921	26,176
<b>Expenses</b>												
Financial expenses	7,775	6,706	11,570	12,727	15,157	18,173	16,590	19,391	17,625	16,806	21,159	14,876
Depreciation and amortization	943	878	1,177	1,181	990	1,166	1,044	902	1,082	448	1,165	381
Administration expenses	1,505	1,533	1,656	1,791	1,821	2,326	2,044	2,712	2,303	3,307	2,424	3,844
provision for losses	427	364	483	644	389	32	363	209	357	528	371	585
Write-off of bad debts	0	0	0	130	362	0	382	0	1,071	0	1,663	0
Total Expenses	10,650	9,481	14,884	16,473	18,719	21,697	20,383	23,214	22,339	21,088	26,782	19,686
Net Income Before Tax	(717)	38	587	1,620	2,340	1,857	3,281	3,045	3,510	4,760	4,139	6,490
Taxes	0	3	0	260	649	362	1,313	814	1,404	937	1,656	854
Net Income After Tax	(717)	35	587	1,360	1,691	1,495	1,969	2,231	2,106	3,823	2,483	5,636

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**Table 5.6: ESTIMATED AND ACTUAL BALANCE SHEETS 1984-1989**  
(Won Million)

Years ending December 31	1984		1985		1986		1987		1988		1989	
	Est.	Actual	Est.	Actual	Est.	Actual	Est.	Actual	Est.	Actual	Est.	Actual
<b>Assets</b>												
Cash and liquid holdings	11,377	32,621	25,179	28,437	41,786	28,257	30,732	18,252	33,830	33,727	31,588	27,133
Interest receivable	1,678	1,687	3,391	2,424	4,875	3,387	7,245	3,563	9,201	3,499	11,855	4,121
Conventional loans	73,152	68,366	111,027	114,514	135,837	157,354	152,831	163,375	163,999	164,752	173,431	172,258
Conditional loans	2,941	2,302	3,417	2,621	4,150	3,923	5,197	4,727	6,429	5,107	8,235	4,009
Equity investments												
Convertible bonds	0	1,748	0	2,376	0	4,657	0	6,891	0	7,587	0	11,632
Equity shares	2,555	611	6,994	1,698	13,061	6,377	20,655	8,941	30,119	12,912	38,516	20,205
Total	2,555	2,359	6,994	4,074	13,061	11,034	20,655	15,832	30,119	20,499	38,516	31,837
Factoring	0	0	0	0	0	0	0	577	0	4,054	0	10,186
Net fixed assets	264	98	282	273	298	295	315	276	330	837	259	1,704
Net front-end fees/deferred charges	2,632	1,086	2,365	963	1,742	710	884	484	2,544	470	2,544	591
Other assets	1,931	2,143	1,931	2,372	1,931	2,707	1,931	3,143	1,931	6,102	1,931	15,444
<b>Total Assets</b>	<b>96,530</b>	<b>110,662</b>	<b>154,585</b>	<b>155,678</b>	<b>203,337</b>	<b>207,667</b>	<b>219,792</b>	<b>210,229</b>	<b>248,382</b>	<b>239,007</b>	<b>268,380</b>	<b>267,283</b>
<b>Liabilities and Equity</b>												
<b>Current liabilities</b>												
Current portion of long-term debt	0	0	0	0	0	26,724	0	68,137	0	28,073	0	11,399
Other current liabilities	2,212	2,231	3,760	3,292	5,904	4,017	7,789	4,319	10,230	7,760	13,012	15,350
<b>Total</b>	<b>2,212</b>	<b>2,231</b>	<b>3,760</b>	<b>3,292</b>	<b>5,904</b>	<b>30,741</b>	<b>7,789</b>	<b>72,456</b>	<b>10,230</b>	<b>35,833</b>	<b>13,012</b>	<b>26,749</b>
<b>Long-term debt</b>												
Borrowings from government	6,000	6,000	24,000	11,000	41,800	21,000	41,450	40,800	40,950	67,450	40,250	81,250
Debentures	42,915	53,724	52,415	65,164	52,415	75,756	42,215	57,323	44,915	50,991	49,165	45,000
Other sources	0	0	0	0	0	0	0	0	0	960	0	1,638
Borrowings from IERD	28,724	26,937	47,773	48,304	65,811	69,538	83,675	66,145	100,623	63,861	108,702	67,543
<b>Subtotal (gross)</b>	<b>77,639</b>	<b>86,661</b>	<b>124,188</b>	<b>124,468</b>	<b>160,026</b>	<b>166,294</b>	<b>167,340</b>	<b>164,268</b>	<b>186,488</b>	<b>183,262</b>	<b>198,117</b>	<b>195,431</b>
Less current portion	0	0	0	0	0	26,724	0	68,137	0	28,073	0	11,399
<b>Subtotal (net)</b>	<b>77,639</b>	<b>86,661</b>	<b>124,188</b>	<b>124,468</b>	<b>160,026</b>	<b>139,570</b>	<b>167,340</b>	<b>96,131</b>	<b>186,488</b>	<b>155,189</b>	<b>198,117</b>	<b>184,032</b>
Severance liabilities	201	283	273	378	351	515	438	620	533	861	638	1,432
<b>Total Liabilities</b>	<b>80,053</b>	<b>89,175</b>	<b>128,221</b>	<b>128,138</b>	<b>166,281</b>	<b>170,826</b>	<b>175,767</b>	<b>169,207</b>	<b>197,251</b>	<b>191,883</b>	<b>211,767</b>	<b>212,213</b>
<b>Equity</b>												
Paid-in capital	18,679	22,834	27,979	27,477	36,979	35,202	41,979	37,202	46,979	39,602	49,979	42,002
Retained earnings	(2,202)	(1,347)	(1,615)	63	77	1,639	2,045	3,820	4,151	7,522	6,635	13,068
<b>Total Equity</b>	<b>16,477</b>	<b>21,487</b>	<b>26,364</b>	<b>27,540</b>	<b>37,056</b>	<b>36,841</b>	<b>44,024</b>	<b>41,022</b>	<b>41,130</b>	<b>47,124</b>	<b>56,614</b>	<b>55,070</b>
<b>Total Liabilities and Equity</b>	<b>96,530</b>	<b>110,662</b>	<b>154,585</b>	<b>155,678</b>	<b>203,337</b>	<b>207,667</b>	<b>217,792</b>	<b>210,229</b>	<b>248,382</b>	<b>239,007</b>	<b>268,380</b>	<b>267,283</b>

**SECOND TECHNOLOGY DEVELOPMENT PROJECT**  
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**Table 5.7: ESTIMATED AND ACTUAL SOURCES AND USES OF FUNDS 1984-1989**  
(Won Million)

Years ending December 31	1984		1985		1986		1987		1988		1989		Total(84-89)	
	Est.	Actual	Est.	Actual	Est.	Actual	Est.	Actual	Est.	Actual	Est.	Actual	Est.	Actual
<b>Sources</b>														
Net income	(717)	35	587	1,360	1,691	1,495	1,969	2,231	2,106	3,823	2,483	5,636	8,119	14,588
Depreciation and amortization	943	878	1,177	1,181	990	1,166	1,044	902	1,082	893	1,165	572	6,401	5,597
Provision for losses	427	364	483	644	389	32	363	209	357	528	371	0	2,390	1,777
Provision for employees' severance lia.	65	169	72	96	79	152	87	267	95	249	105	586	503	1,511
Foreign exchange translation gains/losses (net)	0	(63)	0	376	0	529	0	441	0	(360)	0	(68)	0	831
Write-off of bad debts	0	0	0	130	362	0	382	0	1,071	0	1,663	0	3,478	13
Losses(gains) on sales of fixed assets	0	(12)	0	(1)	0	1	0	2	0	(41)	0	(7)	0	(5)
<b>Internal Cash Generation</b>	<b>718</b>	<b>1,371</b>	<b>2,319</b>	<b>3,786</b>	<b>3,511</b>	<b>3,375</b>	<b>3,845</b>	<b>4,052</b>	<b>4,711</b>	<b>5,092</b>	<b>5,787</b>	<b>6,719</b>	<b>20,891</b>	<b>24,399</b>
<b>Equity</b>														
Government	2,000	2,000	3,000	4,000	4,000	2,000	0	2,000	0	0	0	0	9,000	10,000
Private	2,000	6,155	6,300	643	5,000	5,725	5,000	0	5,000	2,400	3,000	2,510	26,300	17,438
<b>Subtotal</b>	<b>4,000</b>	<b>8,155</b>	<b>9,300</b>	<b>4,643</b>	<b>9,000</b>	<b>7,725</b>	<b>5,000</b>	<b>2,000</b>	<b>5,000</b>	<b>2,400</b>	<b>3,000</b>	<b>2,510</b>	<b>35,300</b>	<b>27,438</b>
<b>Borrowings</b>														
Government	2,000	2,000	18,000	5,000	18,000	10,000	0	20,000	0	27,000	0	15,000	38,000	79,000
Debtors / a	19,000	29,191	9,300	10,857	0	10,000	0	0	38,000	30,000	14,250	15,000	80,750	65,048
IBRD & Others	16,439	15,996	19,049	18,604	18,038	12,101	20,088	12,438	21,396	43,233	22,110	12,823	117,120	115,192
<b>Subtotal</b>	<b>37,439</b>	<b>47,187</b>	<b>46,349</b>	<b>34,461</b>	<b>36,038</b>	<b>32,101</b>	<b>20,088</b>	<b>32,438</b>	<b>59,396</b>	<b>100,233</b>	<b>36,360</b>	<b>42,823</b>	<b>235,870</b>	<b>259,240</b>
<b>Collections</b>														
Conventional loans	5,809	5,354	17,144	12,253	31,800	34,366	44,913	77,111	54,985	85,761	60,341	60,398	214,992	275,401
Conditional loans	276	155	526	465	798	386	952	798	935	1,106	1,009	1,077	4,496	3,987
Convertible bonds	0	52	0	213	0	450	0	691	0	1,574	0	1,903	0	4,882
Equity shares	0	0	0	0	0	2	0	307	196	229	1,651	238	1,847	766
<b>Subtotal</b>	<b>6,085</b>	<b>5,761</b>	<b>17,670</b>	<b>12,931</b>	<b>32,598</b>	<b>35,204</b>	<b>45,865</b>	<b>78,900</b>	<b>56,116</b>	<b>88,670</b>	<b>63,001</b>	<b>63,576</b>	<b>221,335</b>	<b>285,046</b>
<b>Increase in current liabilities</b>	<b>1,268</b>	<b>1,287</b>	<b>1,548</b>	<b>1,061</b>	<b>2,164</b>	<b>725</b>	<b>1,885</b>	<b>302</b>	<b>2,441</b>	<b>2,429</b>	<b>2,782</b>	<b>616</b>	<b>12,068</b>	<b>6,420</b>
<b>Total Sources</b>	<b>49,510</b>	<b>63,761</b>	<b>77,385</b>	<b>56,882</b>	<b>83,291</b>	<b>79,130</b>	<b>76,684</b>	<b>117,692</b>	<b>127,665</b>	<b>198,823</b>	<b>110,929</b>	<b>116,344</b>	<b>525,464</b>	<b>632,532</b>
<b>Uses</b>														
<b>Disbursements</b>														
Conventional loans	46,630	42,363	55,401	56,638	56,861	62,974	62,079	80,561	66,266	93,491	59,888	69,225	357,125	405,252
Conditional loans	1,213	414	1,012	770	1,546	1,725	2,020	1,638	2,192	1,669	2,852	171	10,835	6,387
Convertible bonds	0	1,500	0	950	0	2,750	0	3,243	0	2,274	0	5,940	0	16,657
Equity shares	2,399	413	4,530	1,002	6,190	4,681	8,510	2,568	10,950	4,229	11,950	7,847	44,489	20,740
Factoring	0	0	0	0	0	0	0	586	0	3,530	0	6,225	0	10,341
<b>Subtotal</b>	<b>50,202</b>	<b>44,690</b>	<b>60,943</b>	<b>59,360</b>	<b>64,597</b>	<b>72,130</b>	<b>72,609</b>	<b>88,596</b>	<b>79,408</b>	<b>105,193</b>	<b>84,690</b>	<b>89,408</b>	<b>412,449</b>	<b>439,377</b>
Repayments of borrowings	0	0	0	0	200	5,599	12,574	37,838	40,448	74,122	24,731	28,392	77,953	145,951
Front-end fee/deferred charges	1,460	738	863	429	313	227	125	12	2,670	600	1,095	303	6,526	2,309
Increase in fixed assets	59	34	65	222	71	161	79	84	86	672	0	1,070	360	2,243
Increase in interest receivables	636	645	1,713	757	1,304	975	2,350	180	1,955	147	2,655	0	10,813	2,704
Other uses of funds (net)	0	623	0	298	0	218	0	947	0	2,048	0	14,297	0	18,431
<b>Total Uses</b>	<b>52,356</b>	<b>46,730</b>	<b>63,584</b>	<b>61,066</b>	<b>66,684</b>	<b>79,310</b>	<b>87,737</b>	<b>127,697</b>	<b>124,567</b>	<b>182,782</b>	<b>113,171</b>	<b>133,670</b>	<b>508,101</b>	<b>631,253</b>
<b>Increase (Decrease) in Cash</b>	<b>(2,846)</b>	<b>17,031</b>	<b>13,801</b>	<b>(4,184)</b>	<b>16,607</b>	<b>(180)</b>	<b>(11,054)</b>	<b>(10,005)</b>	<b>3,098</b>	<b>16,041</b>	<b>(2,242)</b>	<b>(17,426)</b>	<b>17,363</b>	<b>1,277</b>

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**Table 5.8: ANALYSIS OF CONVENTIONAL LOANS IN ARREARS 1984-1989**  
(Won Million)

Year	1984	1985	1986	1987	1988	1989
<b>Number of Conventional Loans in Arrears</b>						
Number of loans in arrears under 6 months	4	6	6	22	8	9
- as % of total loans	(1.03)	(1.22)	(1.05)	(3.70)	(1.11)	(1.09)
Number of loans in arrears over 6 months	4	2	5	5	7	4
- as % of total loans	(1.03)	(0.41)	(0.87)	(0.86)	(0.97)	(0.48)
Number of loans in arrears	8	8	11	27	15	13
- as % of total loans	(1.06)	(1.62)	(1.92)	(4.56)	(2.09)	(1.57)
Total number of loans in portfolio	398	492	574	595	719	828
<b>Principal Affected by Arrears</b>						
Total principal outstanding	69,058	115,671	159,484	164,343	192,880	160,300
Principal affected by arrears under 6 months	27	372	263	1,299	467	1,146
- as % of total principal outstanding	(0.04)	(0.32)	(0.16)	(0.70)	(0.24)	(0.71)
Principal affected by arrears over 6 months	735	587	325	422	2,777	801
- as % of total principal outstanding	(1.05)	(0.51)	(0.21)	(0.26)	(1.44)	(0.50)
Total principal affected by Arrears	762	959	588	1,681	3,244	1,947
- as % total principal outstanding	(1.10)	(0.83)	(0.37)	(1.02)	(1.68)	(1.21)
<b>Actual Amounts in Arrears</b>						
Arrears under 6 months	4	46	53	197	67	103
- as % of principal outstanding	(0.00)	(0.04)	(0.03)	(0.12)	(0.03)	(0.06)
Arrears over 6 months	240	234	176	243	260	101
- as % of principal outstanding	(0.35)	(0.20)	(0.11)	(0.15)	(0.13)	(0.06)
Total arrears	244	230	229	442	327	204
- as % of principal outstanding	(0.35)	(0.20)	(0.14)	(0.27)	(0.17)	(0.13)
<b>Collection Performance</b>						
<b>Arrears at beginning of year</b>						
- Principal	89	243	280	229	442	327
- Interest	65	98	98	55	80	133
<b>Total</b>	<b>154</b>	<b>341</b>	<b>378</b>	<b>284</b>	<b>522</b>	<b>460</b>
<b>Amounts falling due during year</b>						
- Principal	5,708	12,099	27,270	77,112	49,530	48,675
- Interest	5,104	9,957	16,146	18,443	14,430	14,065
<b>Total</b>	<b>10,812</b>	<b>22,056</b>	<b>43,416</b>	<b>95,555</b>	<b>63,960</b>	<b>62,740</b>
<b>Collections during year</b>						
- Principal	5,534	12,062	34,372	76,899	49,645	48,798
- Interest	5,071	9,957	9,137	18,418	14,397	14,131
<b>Total</b>	<b>10,605</b>	<b>22,019</b>	<b>43,509</b>	<b>95,317</b>	<b>64,042</b>	<b>62,929</b>
<b>Arrears at end of year</b>						
- Principal	243	280	229	442	327	204
- Interest	98	98	55	80	133	47
<b>Total</b>	<b>341</b>	<b>378</b>	<b>284</b>	<b>522</b>	<b>460</b>	<b>251</b>
Collection ratio /a	96.9	96.3	99.3	99.5	99.3	99.6

/a The collection ratio is defined as follows :

$$\frac{\text{Collections During Year}}{\text{Arrears at Beginning of Year} + \text{Amounts Falling due During Year}} \times 100$$

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**Table 6: KTDC's SHAREHOLDING, ENDING 1989**  
**(Won Million)**

	<u>Amount</u>	<u>Percentage</u>
Government	9,301.3	22.1
KDB	3,698.7	8.8
Yukong	7,000.0	16.7
Lucky	2,852.9	6.8
Hundai	2,842.9	6.8
Samsung	2,842.9	6.8
Kia	1,000.0	2.4
Commercial Bank	760.6	1.8
Sangung	450.1	1.0
Daewoo	405.0	1.0
Hyosung Sung	284.7	0.9
Others (163 shareholders)	5,663.1	13.5
ADB	2,400.0	5.7
DEG	2,400.0	5.7
<b>Total</b>	<b>42,002.3</b>	<b>100.0</b>

**Present Status of KTDC Privatization**

The Government has announced its intention to sell its 15.1% interest in 1990, the remaining 7% by 1992.

Others

1. There is no failed project under the Second Bank Loan.
2. A study was carried out by Korea Advanced Institute of Science and Technology (KAIST) in 1986 to analyze the effect of KTDC's financing activities from 1981-1985.

KAIST is analyzing the effect of KTDC's financing activities from 1981-1989. KTDC will inform the Bank of the result as soon as it is completed.



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Table 7: STATUS OF COVENANTS

Section	Activity	Remarks
<u>Loan Agreement - KTDC:</u>		
2.02 (a)	(i) Relend loan proceeds to finance 100% of the foreign currency cost of imported goods and services or 60% of domestic items and that no withdrawal shall be made unless it complies with provisions of Section 2.03 of the Loan Agreement;	Complied
	(ii) Relend loan proceeds to meet 100% of consulting services, training materials and staff training under Part B of the Project provided no amounts shall be withdrawn in excess of \$300,000 except as Bank may otherwise agree.	Complied
2.02 (b)	Maintain a special account in dollars on terms and conditions satisfactory to the Bank and in accordance with Section 3 of the Agreement.	Complied
2.03 (a)	Withdrawals shall be on the basis of subloans approved by the Bank or if a free-limit subloan one for which Bank has authorized withdrawals.	Complied
2.03 (c)	No withdrawals shall be made before the date of the Agreement, except expenditures not exceeding \$200,000 after 8/1/84 or for subloans approved 90 days prior to Bank's receipt of subloan application	Complied
2.03 (d)	No subloan shall exceed \$1.5 million and no subproject shall be eligible to receive more than \$5.0 million.	Complied
2.03 (c)	Applications shall be presented to the Bank on or before 6/30/87.	Complied
2.10 (c)	Except otherwise agreed, KTDC shall charge interest on subloans made as Conventional Loans which will provide KTDC with a spread of at least 2-1/2%.	Not Complied from 1985-89
3.06	KTDC shall ensure that maximum outstanding loans and equity in a single entity shall not exceed 7% of KTDC's long term portfolio or W4.2 billion whichever is higher.	Complied
4.01 (a)	KTDC shall maintain adequate procedures and	Complied

STATUS OF COVENANTS

Section	Activity	Remarks
<u>Loan Agreement - KTDC:(continued)</u>		
	records and reflect operations and financial condition, including expenditures under statement of expenditures in accordance with sound accounting practices.	
4.01 (b)	KTDC shall:	
	(i) Have its accounts and financial statements audited in accordance with sound auditing principles by independent auditors acceptable to the Bank;	Complied
	(ii) Furnish the Bank, as soon as available but in any case not later than four months after the end of each year: certified copies of the financial statements as audited; and the report of such audit by said auditors, of such scope and in such detail as the Bank shall have reasonably requested.	Complied
4.04	KTDC shall take all necessary action to increase its authorized capital to W37 billion on or before 12/31/84.	Complied
4.05	Except as the Bank shall otherwise agree, KTDC shall enter into satisfactory arrangements with Borrowers and prospective shareholders whereby an additional amount on no less than W13.3 billion will be paid into capital on or before 12/31/86.	Not Complied only W 12.6B was raised
4.06	Except as the Bank shall otherwise agree, KTDC shall maintain at all times a debt/equity ratio of no greater than five times the consolidated capital and surplus of KTDC and its subsidiaries.	Complied

STATUS OF COVENANTS

Section	Activity	Remarks
<u>Guarantee Agreement - Government:</u>		
3.04	Government and the Bank shall exchange views on the Government's industrial technology development policies to identify major issues or areas of special study or action.	Complied
3.05 (a)	Government shall permit KTDC to increase its authorized capital to no less than W37 billion with amendments to KTDC's Act, Decree and By-laws on or before 12/31/84.	Complied
3.05 (b)	Government shall make available to KTDC no less than W3 billion on or before 12/31/85 by way of further subscription to KTDC's paid-in capital.	Complied
3.05 (c)	Government shall provide KTDC by way of loans an aggregate amount of up to W20r billion on or before 12/31/85.	Not Complied <sup>1/</sup>
3.06 (d)	Government shall provide a guarantee for KTDC's debentures in an aggregate amount of W30 billion on or before 12/31/85.	Complied
3.06 (e)	Government shall provide KTDC additional funds to cover losses suffered by KTDC on account of Conditional Loans made.	Complied

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<sup>1/</sup> Actual government loans contributed for the period was only W7 billion. However, the Government provided an additional W10 billion in 1986 and W20 billion in 1987 for a total of W37 billion for the project period.

**SECOND TECHNOLOGY DEVELOPMENT PROJECT (LOAN 2473-KO)**

**Table 8.1: USE OF BANK RESOURCES**  
**STAFF INPUTS**

Stage of Project Cycle	FY83	FY84	FY85	FY86	FY87	FY88	FY89	FY90	FY91	TOTAL
Preparation	5.3	9.5	-	-	-	-	-	-	-	14.8
Appraisal	-	25.6	6.7	-	-	-	-	-	-	32.3
Negotiations	-	-	5.7	-	-	-	-	-	-	5.7
Lending Operations	-	9.9	5.9	-	-	-	-	-	-	15.8
Supervision	-	-	3.5	6.3	16.3	5.8	1.2	0.1	-	33.2
Completion	-	-	-	1.3	-	-	-	0.6	1.3	3.2
Administration	-	-	0.1	1.4	0.9	-	-	-	-	2.4
<b>TOTAL</b>	<b>5.3</b>	<b>45.0</b>	<b>21.9</b>	<b>9.0</b>	<b>17.2</b>	<b>5.8</b>	<b>1.2</b>	<b>0.7</b>	<b>1.3</b>	<b>107.4</b>

**SECOND TECHNOLOGY DEVELOPMENT PROJECT  
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**Table 8.2: USE OF BANK RESOURCES  
MISSIONS**

Stage of Project Cycle	Month Year	No. of Persons	Days in Field	Specialization Represented	Major Issues
Through Appraisal:	5/83	4	5	Industrial Economics, Electronics & Light Industries	Interest rate spread, Capital structure of KTDC, Free limit on subloans Retrocative financing & Bank lending.
Appraisal through Board Approval	9/83	3	16	Industrial Economics	-
	12/83	5	21	Financial Policy Industrial Economics Development Banking	Loan terms, KTDC debt structure, interest rate, SMIs, Alternative financial instruments & Science & technology studies.
Supervision:					
Mission 1	3/85	1	NA	Industrial Economics	-
Mission 2	11/85	2	5	Telecommunications & Electronics Specialists	-
Mission 3	5/86	2	3	Telecommunications & Electronics Specialists	-
				Industrial Economist	-
Mission 4	10/86	NA	1	Industrial Economist	Loan implementation, IFC contribution, new debenture issues, Future Bank funding of ETRI
Mission 5	11/86	2	2	Industrial Economist	Inadequate spreads, Cost of Bank funds & IFC involvement.
Mission 6	5/87	1	2	Industrial Economist	-